

**Validity evidence to explore the educational impact for using a single-point rubric in  
Interprofessional Education**

by

Cheng In Chao

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## Abstract

**Introduction:** Many interprofessional (IP) assessments and instruments were developed and utilized in Interprofessional Education (IPE). However, few studies regarding IPE are about the impact of assessments and instruments to support student learning, teaching, and decision making (Jill Thistlethwaite et al., 2015). In this thesis, the single-point rubric (Gonzalez, 2015) was developed and validated to explore its educational impact to support learning and teaching. A single-point rubric contains the expected performance criteria and a separated area to construct narrative feedback regarding the pros and cons of performance. The research question is: To what degree does the single-point rubric support student learning and facilitators to construct feedback within the context of IPE?

**Methods:** I tested the single-point rubric in an IP foundational and elective courses. Course developers and I worked together to approve the criteria in the single-point rubric which were consistent with the learning objectives of the IP assessments. Kane's validity framework guided the whole validation process in this thesis. First, I created the hypotheses (i.e. Interpretation/Use Arguments - IUAs) of the impact of using the single-point rubric in several IP assessments. Then, I determined the data sources of the validity evidence to support IUAs. The collected validity evidence was the data from stakeholder surveys, interviews/focus groups, and the completed single-point rubrics. After collecting, synthesizing, and appraising the data, I supported, rejected, or revised the IUAs and formulated the final validity arguments corresponding with the proposed IUAs.

**Results:** The facilitators could use the single-point rubric to provide structured and potentially helpful feedback, and they followed most of the orientation principles to use the rubric. However, some facilitators did not provide suggestions for improvement to students, even though it is one

of the principles of using the rubric. The students agreed with the feedback and could identify the strengths and weaknesses of the performance from the feedback. With suggestions from the facilitators and students' engagement with the feedback, students could utilize the directions for improvement in future IP learning.

**Conclusion:** The single-point rubric has the potential to help construct helpful narrative feedback to students, and students could use the feedback to support future learning.

## **Preface**

This thesis is an original work by Cheng In Chao. The research project, of which thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board 2, Project name “Assessment and evaluation of competencies for collaborative practice within the Interprofessional Learning Pathway, No. Pro00076449, October 11, 2019.

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## **Chapter 1 Introduction**

In 2010, the World Health Organization (WHO) reported that many fragmented health systems in the world might struggle to meet contemporary health needs because of the increasing number of complex health issues and the lack of interprofessional (IP) experience (WHO, 2010). Interprofessional Education (IPE) is a key approach in moving fragmented to integrated health systems, which eventually improve the quality of care. IPE allows health professions students unite, learn strategies of IP interaction, and prepare for collaborative practice (WHO, 2010). (WHO, 2010). To examine the effectiveness of IPE and student learning outcomes, many IP assessments were developed and appraised (Oates & Davidson, 2015; Jill Thistlethwaite et al., 2015). However, there have been few studies regarding IPE and the impact of assessment on learning. Generally, assessment in higher education is often thought of as an approach to test students' ability and award a grade, few assessment systems may consider the application of assessment to support student learning and decision making (McDowell, 2012; Thistlethwaite et al., 2015). Some long-established studies show the significant impact of assessment on learning (Marton et al., 1997; Sambell & McDowell, 1998). Since the end of the 1990's, there has been a shift from "assessment of learning", with an emphasis on testing and producing grades, to "assessment for learning" that supports and promotes student learning (McDowell, 2012). To accomplish "assessment for learning", McDowell et al. (2007) advocated several actions including conducting authentic assessments, balancing formative and summative assessments, and providing effective feedback to promote student learning. I moved from this concept in general higher education to the context of IPE, because the mindset of supporting student IP learning through assessment is desirable and worthy of further exploration. Therefore, it may be valuable to develop and validate an instrument to be used in authentic IP assessments, which has the potential to help provide effective feedback, be applied in both formative and summative approaches, and support IP learning.

### **1. Context and rationale of the research**

An international consensus statement on the assessment of IP learning outcomes strongly encouraged global IP instructors to consider key learning outcomes and operate high-quality assessments in IPE, to optimize IP learning and quality of care. The consensus on the purposes of

assessment was to promote learner engagement, support further learning, and enhance health outcomes, instead of considering assessment solely for accountability (Rogers et al., 2017).

The context for this study was the institutional IP curriculum, known as the IP Learning Pathway (Figure 1), at the University of Alberta. The Health Sciences Education and Research Commons (HSERC) at the University of Alberta developed the IP Learning Pathway which included an introductory IP experience (an IP pathway launch), a required foundational course for all health sciences programs, a series of elective courses, and a bridge into practice (HSERC, 2019). The curricula contained online and face-to-face sessions. Competency-based assessment (CBA) was implemented in each course to examine IP team performance. CBA is an assessment approach to help health educators move beyond knowledge examination and directly assess the clinical competencies of health students since various complex clinical skills are difficult to evaluate by a traditional paper exam. Many CBAs involved the use of simulation, standardized patients (SPs), or written or videotaped scenarios. Objective Structured Clinical Examination (OSCE) is a type of CBA (Erdogan et al., 2016). IP CBAs are usually team-based, in which interdisciplinary students are grouped as a healthcare team and would be asked to work together. For example, an IP student team would simulate a scenario using role-play in several stations, or they would communicate with both team members and SPs to establish a care/intervention plan. To assess collaborative competencies in IP CBAs, facilitators generally observe team performance during their interaction with a scenario or SP and then give a score and/or use checked items to assure that the learning objectives are met. However, though using a rating scale or a checklist is convenient for grading and checking attainment, it is uncertain that such instruments could support student learning, because learning expectations, quality of team performance, and direction for improvements in a rating scale are limited. And, despite a checklist contains descriptors of learning expectations, a checklist is for dichotomous results (typically achieved or did not achieved), without demonstrating the relative quality of team performance and providing sufficient guidance for student learning (Brookhart, 2018; Pamelabonus, 2013). Brookhart (2018) suggested that a useful instrument (i.e. rubric) for supporting learning should involve transparent expectations/criteria of an assessment, and the results on the instrument could be applied for future learning guidance. To implement learning guidance, the provision of helpful feedback by facilitators would be a potent way (Algiraigri, 2014), as feedback process is crucial in an assessment that can provide timely and actionable information to accelerate student learning and

empower self-regulation (Irons, 2018; Jug et al., 2018; Nicol & Macfarlane-Dick, 2006; Panadero & Jonsson, 2013). With this rationale, the aim of the thesis is to develop a useful instrument (i.e. a single-point rubric) containing transparent performance expectations and space to write suggestions for improvement in order to help instructors construct structured feedback and support IP learning.

## **2. Hypotheses and the Interpretation/Use Arguments (IUAs)**

Kane (2013) labeled claims or hypotheses of using an assessment instrument in his validity framework as Interpretation/Use Arguments (IUAs). The IUA is used to designate the projected interpretations and uses of the information generated by the assessment instrument for a specific population and context, to compose reasoning and guide collecting relevant validity evidence to explain and support the interpretations and uses. For an IUA to be correct, it should be supported by logical validity evidence. Validity evidence consists of various types from varying sources and can be collected quantitatively and qualitatively according to the need (Cook et al., 2015). The process to collect, interpret, and analyze validity evidence is “validation”, the validation process by using Kane’s validity framework is displayed in Figure 2, which was applied in this thesis. Examples of types of validity evidence linked with four inferences within Kane’s validity framework are presented in Table 1.

To specify the hypotheses of the intended use of the single-point rubric – support IP learning and teaching, two inferences were applied, Implications and Scoring, which are inherent in Kane’s validity framework (Kane, 2013). Of its four inferences, the Generalization and Extrapolation inferences were not accepted because Cook et al. (2015) contended that the former may be less vital when the emphasis is on formative feedback, and the latter may be less important for assessments relying on direct observation of clinical performance. In this research, the exploration of educational impact primarily aligned with the Implications inference that emphasizes the interpretation of assessment information and the consequence of using that information. The Scoring inference is quantitatively affected by the accuracy of scores and qualitatively affected by the authenticity of judgements and the credibility of assessors (Cook et al., 2015; Kane, 2013).

The formulated IUAs, which guided the collection and interpretation of validity evidence in this thesis were: For the Implications inference, (1a) Facilitators could provide structured and helpful feedback by using the single-point rubric. Students agreed with the feedback and were able to identify their strengths and weaknesses. (1b) After engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning. For the Scoring inference, (2) Facilitators followed the orientation principles to use the single-point rubric, wrote feedback referencing the criteria on the rubric, and captured key aspects of performance.

### **3. Objectives**

The focus of this thesis was to develop, pilot, and validate an instrument – a single-point rubric – employed in IP authentic assessments (e.g. CBA). The research question was: To what degree does the single-point rubric support student learning and facilitators to construct feedback within the context of IPE? The primary objective was to collect and interpret the validity evidence regarding the use of the single-point rubric in the assessments. The data source of the validity evidence was the qualitative data from the completed single-point rubric and stakeholder interviews and both quantitative and qualitative data from the stakeholder surveys. The validity evidence would mainly support the proposed IUAs associated with the Implications and Scoring inferences within Kane’s validity framework (Kane, 2013) and would be further analyzed to explore the educational impact of using the single-point rubric in IP assessments.

### **4. Organization of the thesis**

This thesis is organized into six chapters. Chapter 1 contains an introduction to the context and rationale, hypotheses, research question, and the objective of this thesis. Chapter 2 consists of a review of the concepts of constructive alignment and assessment literacy, the assessment and instrument applied in IPE, validation of an instrument, formative and summative assessments, and information about the meaningfulness of feedback. Chapter 3 includes the detailed information about the context, methods, and findings of the pilot study implemented in the IP foundational course. Chapter 4 comprises of a discussion of the pilot study implemented in the IP elective course. Chapter 5 is a summary of the overall findings in both Chapters 3 and 4, the evaluation of the validity evidence, the formulation of the final validity arguments, and exploration of the

educational impact of the single-point rubric. Chapter 6 contains a concluding discussion of the thesis, its limitation, and suggestions for future research.

## **Chapter 2 Literature Review**

### **1. Assessment in Interprofessional Education (IPE)**

#### ***1.1 Interprofessional (IP) competencies in the national framework***

In 2010, the Canadian Interprofessional Health Collaborative (CIHC) published “A National Interprofessional Competency Framework” composed of the knowledge and judgements from health organizations, workers, researchers, and students across Canada (CIHC, 2010). This national framework generated the competencies required for effective IP collaborative practice, the six competency-domains are: 1) Interprofessional Communication, 2) Team Functioning, 3) Role Clarification, 4) Interprofessional Conflict Resolution, 5) Collaborative Leadership, 6) Patient/Client/Family/Community-Centred Care. Appendix A contains the details of these six competencies. The CIHC framework can guide IP course development, help students and practitioners make sense of the IP learning process, and integrate their learning experience to clinical practice over their professional lifespan. The HSERC at the University of Alberta modified and applied this national framework in the IP foundational and elective courses. The intended learning outcomes decided in each course and assessment corresponded to the competencies above.

#### ***1.2 Constructive alignment and assessment literacy.***

*Constructive alignment* indicates the logical connection between class activities, intended learning outcomes, assessments, and scoring. Good instructors should be clear on the learning objectives, and what activities and assessments should be conducted to correspond with the learning objectives. The implementation of constructive alignment would support students to identify their learning progress on a legitimate continuum in a course and increase active engagement (Biggs, 1996; Biggs & Tang, 2011; McDowell, 2012). Researchers argued that the absence of constructively aligned course components would limit the effectiveness of the course and affect the generalizability of an IP course to authentic collaborative practice (Thistlethwaite, 2012; Vuurberg et al., 2019). In the present pre-qualification IPE, the constructive alignment of



many courses may be threatened, as the intended learning outcomes sometimes may not align with class activities and assessments. This inconsistency challenges the efficacy of the entire IP curricula (Vuurberg et al., 2019). For example, when learners have the lectures and activities about collaborative interaction and practice, but the assessment piece unexpectedly measures non-collaborative competencies such as attitudes and perceptions toward IPE (Riskiyana et al., 2018), learners may find themselves confused about the essence of the course and may question the effectiveness of the course to prepare them for a “collaborative-ready workforce”.

This situation raises the concern of why the inconsistency between IP assessments and intended learning outcomes would occur. The reason for this situation may be that it is time-consuming to achieve constructive alignment for an IP course, or some instructors may not understand how to select a legitimate assessment method and instrument to match the intended learning outcomes. The later reason caused this researcher to consider *assessment literacy* in IPE. Assessment literacy highlights instructors’ comprehensiveness of fundamental assessment goals, concepts, and procedures (Popham, 2018). For example, if instructors are assessment literate, they know what approaches and steps should be taken in an assessment to determine the intended learning outcomes. If instructors are not assessment literate, they fail to select a potent assessment method to examine the intended learning outcomes, and that might threaten the constructive alignment (Popham, 2018; Wolsey et al., 2020). Though a number of courses exhibit their intended learning outcomes related to collaborative competencies (e.g. behaviours of team functioning and communication), their selected assessment tools focus on measuring learners’ perceptions and attitudes towards IPE (Riskiyana et al., 2018; Vuurberg et al., 2019). Therefore, the dilemma is whether IP instructors are aware of the principle of assessment literacy in the IPE context and the match between intended learning outcomes and assessment tasks.

### ***1.3 Summative and formative assessments***

The concepts of “assessment of learning” and “assessment for learning” were briefly discussed in Chapter 1. The centrality of summative assessment is “assessment of learning”. The purpose of summative assessment is to summarize learner achievements, evaluate student mastery, decide grades for report cards, and give this information for recording learning outcomes to inform further education or employment (Herman, 2016; McDowell, 2012; Nitko, 2011; Sambell et al., 2012). The common types of summative assessment are tests, assignments, or projects, which

usually result in a score or a grade at the end of an assessment or a course. The advantages of summative assessment are the provision of motivation for students to learn and concentrate on the class, so that students motivated by the increase of scores would pay attention in study. It is considered essential within an institution to provide a measurable outcome so that instructors know students' levels and can update the courses to better fit the teaching to enhance student learning (Robinson, 2016). The disadvantages of summative assessment are that instructors are blamed for "teaching to the test", and students may only care about the grade other than the process of learning. Summative assessment is usually utilized less regarding suggestions for improvement than the formative assessment (Nitko, 2011). Summative assessment is the final product of what has been learned, whereas formative assessment involves the process of learning (Robinson, 2016).

The core of formative assessment is related to "assessment for learning", the purpose of formative assessment is to inform learners regarding the learning outcomes and feedback from instructors, so that learners could comprehend current capacities and perceive what to improve further (Irons, 2018; Sambell et al., 2012). Developing an assessment in a formative manner, instructors should take time to consider the development of high-quality curriculum-embedded tasks to present explicit learning expectations and progressions (O'Malley et al., 2013). Formative assessment is a process more than a test or exam. This process includes students' and instructors' use of assessment information to adjust to what they did and should do next (Popham, 2011). Furthermore, formative assessment focusses on how the assessment information (e.g. feedback) will be utilized and not by the construction or format of the assessment (William, 2006). Importantly, the provision of effective, meaningful feedback involving suggestions for improvement is the key function in formative assessment (McDowell, 2012). The role of an instructor in a formative assessment is to interpret students' performance and then give feedback to suggest the next steps in learning. To increase the accuracy and usefulness of feedback, the assessment task should be meaningful to students and instructors, and able to reflect students' real capacities (O'Malley et al., 2013). Ideally, a good formative assessment process would include an opportunity for students to use the feedback and take action (Brookhart, 2011).

**1.3.1 Meaningfulness of feedback.** Meaningful feedback informs people how close they are to the goals and reinforce improvement (London, 2014). The identification of feedback is the key component of formative assessment. Researchers have reported several strategies to give

effective, formative feedback. Shute (2008) suggested task-level feedback, which could give specific, timely (at the moment), supportive and non-evaluative information. Ramani and Krackov (2012) gave twelve tips to provide effective feedback in the clinical education environment. For example, they suggested communicating the objectives for feedback with stakeholders, providing timely feedback, reinforcing and correcting observed student performance, confirming students' understanding of feedback, suggesting with an action plan, and counting feedback as a part of institutional culture.

Feedback is generally information offered by people to reveal the gap between learner competency and the intended learning outcomes. Hattie and Timperley (2007) developed three questions asked by a student or an instructor to provide effective feedback: Where am I going? (What are the criteria?), How am I going? (What actions are performing toward the criteria?), and Where to next? (What practices need to be undertaken to attain better performance?). For learners, the top explanation of feedback is the information that helps them perceive "where to next" (Hattie et al., 2018). The most meaningful feedback likely focuses on the provision of guidance for improvement. If the feedback is given by an instructor to a student, the assessment criteria should be shown to the students. The instructor is expected to be capable to give feedback involved the description of observed performance and actions, the rationales of why students perform well or not, and the provision of guidance for improvement (Brookhart, 2017; Gibbs & Simpson, 2004; Jug et al., 2018).

The effectiveness of feedback process depends on students' precise understanding and interpretation of the feedback, and their engagement with the feedback and motivation to address their issues in future learning (Brookhart, 2017; Jacoby et al., 2014; Rushton, 2005). If learners cannot understand the feedback, they are unable to use the feedback for improvement, or ignore the feedback, the feedback may be useless (Hattie et al., 2018). Ideally, meaningful feedback allows students to recognize the areas for improvement and to self-regulate learning (Aboulsoud, 2011; Nicol & Macfarlane-Dick, 2006). Self-regulation needs the students' capacities including the readiness to make effort into seeking and incorporating feedback, the ability to self-assess and plan to change, the level of confidence to ask for further help. Less effective students have few self-generated thoughts and actions (Hattie & Timperley, 2007). In summary, providing

meaningful feedback and optimizing learning needs both students' learning engagement and instructors' awareness of using relevant strategies to give good feedback.

**1.3.2 Balancing formative and summative assessment.** Awareness of balancing the assessment approaches in universities has increased (Knight & Yorke, 2003). Both formative and summative assessment methods have their advantages and roles in education. Yet, the balance between formative and summative approaches has challenges (Clouder et al., 2012). For example, there may be environmental issues when instructors find no time for delivering a formative assessment activity and giving feedback, especially if the course is large-scale which makes the formative activity time-consuming (McDowell, 2012). Instructors could try reducing the number of summative assessment and teach the students regarding the purpose and advantages of formative assessment to help them learn, or instructors could use both formative and summative approaches in a single assessment (McDowell, 2012). Notably, balancing formative and summative approaches in an assessment does not mean that they have equal values. Educational experts deem that formative assessment has more weight than summative assessment in teaching and learning (Sambell et al., 2012). Yorke (2003) suggested using formative assessment to promote learning other than letting summative assessment to drive the learning process. The focus of formative assessment should be on supporting, shaping, and motivating self-regulation in learning (Aboulsoud, 2011; Carrillo-de-la-Peña et al., 2009; Nicol & Macfarlane-Dick, 2006), which should be the purpose of an assessment.

#### ***1.4 Competency-based assessment (CBA)***

The importance of IP assessments is to recognize IP learning that has happened, provide more information on and insights on student learning experience, and empower the effectiveness of both teaching and learning (Davis et al., 2013; Tan, 2017). The ultimate objective of IPE is to assist learners in attaining certain collaborative competencies and enhance the quality of health outcomes (Riskiyana et al., 2018). However, current IP assessment poorly corresponds with this final goal of IPE, because the number of authentic assessments used to examine real collaborative competencies is limited, or some IPE programs utilize such assessments but do not measure the occurred collaborative competencies rigorously (Simmons & Wagner, 2009).

Competency-based assessment (CBA) is a common type of authentic assessment that involves simulation and allows learners to implement “doing” other than “knowing”. Importantly, CBA can be applied to observe actual collaborative competencies, and facilitators can adopt a rigorous instrument to determine IP learning outcomes and make judgements (Fox et al., 2018; Riskiyana et al., 2018; Wood et al., 2009). The advantages of CBA for learning are that most learners prefer interacting with peers and perform real skills during lectures in IP learning (Lockeman et al., 2017), and it may increase learners’ satisfaction with learning and confidence in communicating with other professionals and patients (Ragucci et al., 2016; Sander et al., 2016). Additionally, CBA can involve both formative and summative elements.

## **2. Instruments used in IP assessments**

### ***2.1 Types of instruments and educational impact***

Self-report instruments are often utilized after a class activity or at the end of an IP course (Riskiyana et al., 2018). In correspondence with the content regarding constructive alignment and assessment literacy, the application of many self-report questionnaires in IPE to examine students’ attitudes and perceptions may not precisely demonstrate actual collaborative competencies (Curran et al., 2011; Riskiyana et al., 2018; Spaulding et al., 2019; Thistlethwaite et al., 2015). For example, the Readiness for Interprofessional Learning Scale (RIPLS) and the Interdisciplinary Education Perception Scale (IEPS) are the most widely adopted self-report questionnaires in IPE to assess attitude and perception. In contrast, researchers have reported that making a judgement on instruments through direct observation by an external observer (e.g. CBA) can better reflect the real collaborative competencies among learners (Curran et al., 2011; Riskiyana et al., 2018; Spaulding et al., 2019; Thistlethwaite et al., 2015). The general types of instrument employed in IP assessment through observation are rating scales and checklists, both of which contain descriptive criteria. A rating scale is used to score for individual or team performance across a numerical scale (e.g., 1-4) or an evaluative scale (e.g., unsatisfactory-fair-satisfactory-excellent) that correspond to different levels of performance. For instance, Mayo High Performance Teamwork Scale (MHPTS) and Interprofessional Collaborator Assessment Rubric (ICAR) are commonly used in CBAs by external observers to make judgements (Chen et al., 2019; Oates & Davidson, 2015; Welsch et al., 2018). A checklist requires dichotomous judgement, such as whether an individual or a team does/ does not attain the criteria, but it barely indicates the presence

of different levels of performance indicators. Many checklists used in IP assessments are developed in-house and generally not named (Aston et al., 2012; McCutcheon et al., 2017; Nelson et al., 2017). In comparison to a rating scale or checklist, rubrics can illustrate the level of performance expectation transparently, so that students can perceive how their learning should look like before assessment and reflect on achievements from the rubric results to monitor further learning after assessment. A typical rubric contains the criteria that illustrate what to look for in an assessment and performance level descriptions that instantiate what performance aligns with the specific criterion (Brookhart, 2018). Brookhart (2018) argued that some rubrics adopted in higher education are rating scales. That is, some rubrics use “rating-scale language” such as the frequency of performance occurrence to provide performance level descriptions, instead of transparently describe the quality of student performance.

In this thesis, the educational impact (i.e. usefulness of supporting IP learning) of the single-point rubric was explored. Although several studies have evaluated the educational impact of IP assessment methods and courses (Cunningham et al., 2014; Kelly et al., 2018; Lavelle et al., 2018; Mecca et al., 2019), the impact of instruments was less reported. Olupeliyawa et al. (2014) examined the educational impact of an instrument used in IP workplace-based observational assessment. That instrument contained expected performance descriptions for each competency, and facilitators were required to write open-ended feedback on the instrument after direct observation. Eventually, students were asked to plan actions based on the written feedback and verbal discussion with facilitators, and then they needed to reflect and record the formulated action plans. Olupeliyawa et al. (2014) concluded that the instrument had a positive influence to offer effective feedback, inform self-assessment, and promote learning. Also, the reflection and action planning according to external cues may enhance student self-evaluation and self-awareness.

### **3. Introduction of the single point rubric**

A single-point rubric, first created by Gonzalez (2015), has the potential to help students receive and handle the narrative feedback for supporting future learning. This type of rubric has not been adopted in IPE, and this thesis would be the first. A single-point rubric includes performance criteria among a couple of competencies, and notably, it only shows the expected level of criteria rather than a progression of performance descriptions. In particular, a single-point rubric contains three columns – the middle column presents the criteria of each competency, the

left column is for writing feedback on the areas that could be improved, and the right column is for writing comments on what goes well. If facilitators observe a team fulfilling all the criteria in a competency, they do not need to write feedback on the left and right columns. When facilitators found a team not meeting the criteria or performing outstandingly, they have to write feedback on the left or right column, respectively.

The apparent benefits of using the single-point rubric are that the rubric construction makes students and facilitators comprehend performance expectations efficiently and facilitators can write individualized feedback regarding the strengths and weaknesses of learner performance. Researchers have reported that sharing assessment criteria with students, to attain assessment transparency, could minimize student anxiety and enhance self-regulated learning (Jönsson & Prins, 2019). Furthermore, the power of a good rubric can enhance student learning and promote instruction (Brookhart, 2018). In this regard, a single-point rubric offers a different way to make judgements compared to traditional rubrics and has the potential to promote learning and teaching. Except for presenting succinct performance criteria, a single-point rubric leaves space for facilitators to write open-ended feedback and does not place boundaries on team performance (Hashem, 2017). The creation of this rubric focuses on the provision of narrative, specific feedback over the grade, which can help students monitor and plan their learning. However, the main disadvantage is the requirement of more writing on the instructors' end (Gonzalez, 2015).

#### **4. Validation of an instrument**

##### ***4.1 Functional perspective on assessment validity***

The majority of pre-qualification IPE is implemented in classrooms, some with a few sessions delivered in training wards or clinical units (Gough et al., 2012). When validating an instrument used in the classroom setting, two validity perspectives are relevant: the “measurement perspective” pays attention to the accuracy of scores assigned; and the “functional perspective” focuses on the extent of an instrument fit its intended use (Kane & Wools, 2020). To explore the educational impact (i.e. usefulness to support learning) of the single-point rubric, the functional perspective of validity is more relevant and should be applied in the context of IPE classroom-based learning.

## ***4.2 Kane's validity framework***

The purpose of a validity framework is to collect relevant evidence to support the claims or hypotheses of the application of an instrument (Cook et al., 2015; Tavares et al., 2018). Kane (2013) developed a validity framework to help educators and researchers identify and prioritize the most vital pieces of evidence to support the intended use of an assessment tool and recognize the evidence gaps that do not support the intended use. Figure 2 shows the validation process using Kane's validity framework. The first step is to formulate the Interpretation/Use Arguments (IUAs) and then construct and plan the assessment and instrument corresponding with the IUAs. The second step is to prioritize the weakest or the most questionable inferences (e.g. Scoring, Generalization, Extrapolation, and Implications) for testing. The third part is to establish a plan and determine the source of validity evidence to analyze the IUAs that link with the key inference category. The final part is to analyze the collected validity evidence and formulate final validity argument (Kane, 2012; Tavares et al., 2018).

In comparison to traditional validity frameworks that suffer from testing varying types of validity (e.g. construct validity, content validity) and prioritizing the most questionable assumption, Kane's validity framework addresses the issue by the allowance of prioritizing the most questionable inferences in validation, and validity evidence associated with the inferences used to support the proposed hypotheses of interpretation and use of a tool (Cook et al., 2015). Also, Kane's validity framework is limitless and can be applied to quantitative, qualitative, and programmatic assessment tools. Moreover, this contemporary validity framework focuses on decisions and consequences of assessment, which determines whether a decision or its accompanying consequence is useful for stakeholders.

**4.2.1 Inferences.** There is a chain of four inferences in Kane's validity framework: Scoring, Generalization, Extrapolation, and Implications. (1) "Scoring" emphasizes the accuracy of a quantitative rating or insightful qualitative comment transformed from the observation of performance. Qualitative evidence will ideally exhibit the authenticity and fairness of written comments or narratives. (2) "Generalization" determines whether the results of an assessment can represent the results in other similar assessments or clinical events. Qualitative evidence will ideally show the reflexivity and transparency of the assessment process and the congruency of outcome interpretations formed by varying assessors. (3) "Extrapolation" indicates how well the



assessment results correlate to real-life performance. Qualitative evidence will ideally display the correlation between qualitative results and other measures such as quantitative data, and whether stakeholders agree that the outcome interpretations can apply to new training and practice contexts. (4) “Implication” underlines how the assessment consequence affects decision making. Qualitative evidence will ideally demonstrate the impact of the consequences on learners and assessors, whether stakeholders agree with the final judgement, and the effectiveness of the assessment results for remediation (Cook et al., 2015; Cook & Hatala, 2016; Tavares et al., 2018). Table 1 contains a summary of the validity evidence for each inference.

**4.2.2 The concepts of interpretation/use argument (IUA) and validity argument.** The claim or hypothesis regarding the use of an assessment tool is described as IUA, which should be decided at the beginning of validation for guiding evidence collection. Based on Kane’s validity framework, IUAs are associated with the inferences but it is unnecessary to make IUAs for every inference. We can prioritize the most important inferences and only propose IUAs associated with those inferences. The source and types of validity evidence must be able to support the IUAs. After gathering and appraising the relevant validity evidence, we should compare the findings to our original hypotheses (i.e., IUAs), identify the met and unmet findings, and then formulate final validity arguments in relation to IUAs. Gaps may occur between the evidence and the proposed IUAs, the function of validity argument is to demonstrate the factual consequence of using an instrument in a certain context (Cook et al., 2015; Cook & Hatala, 2016).

## **5. Summary of literature review**

Constructive alignment between the assessment activities and intended learning outcomes in IP courses is sometimes threatened. There is a question if IP educators are assessment literate to select a potent assessment method to evaluate the intended learning outcomes and align with the course content. Two assessment methods including summative and formative assessment are always discussed in school and higher education. Summative assessment focusses on the final product of what has been learned, whereas formative assessment focusses on the process of learning. In the context of IPE, whether students can develop, perform, and promote collaborative competencies is important. Since a score from the summative assessment may be less meaningful for students to further improve the real competencies, the formative assessment process may benefit more in IPE because such process is concerned of providing effective feedback and

suggestions for improvement. Though feedback is powerful to support learning, barriers like the provision of feedback without clear suggestions, students not knowing the assessment criteria, or lack of engagement with the feedback could reduce the power of feedback. There are many rating scales and rubrics developed in IPE; however, few of them were created for providing formative feedback. Therefore, the development of an instrument that includes performance criteria, is helpful for facilitators to construct feedback, and has space for facilitators to provide guidance in learning could be valuable for IP competency-based learning. The format of the single-point rubric likely fits these intended uses. To develop and test the single-point rubric for whether it fulfils the intended uses, validation is essential to be processed where the validity evidence is collected to support the hypotheses (i.e. IUAs) of the intended uses. Kane's validity framework was utilized in this thesis to guide the validation process, evidence associated with the Implications inference can further explain the educational impact (i.e. usefulness of feedback) of the single-point rubric.

### **Chapter 3 Developing and piloting the single-point rubric in the foundational course**

This chapter contains a discussion of the pilot study implemented in the IP foundational course. The focus of this study was to develop, pilot, and validate a single-point rubric employed in IP assessments. The research question was: To what degree does the single-point rubric support student learning and facilitators to construct helpful feedback within the context of IPE? The primary objective was to qualitatively collect and interpret validity evidence for the use of the single-point rubric in IP assessments. The validity evidence extracted from the survey and interview data and the completed single-point rubrics mainly support the proposed IUAs associated with the Implications and Scoring inferences within Kane's validity framework (Kane, 2013) and were further analyzed to explore the educational impact (i.e. support learning and constructing helpful feedback) of using the single-point rubric.

#### **1. Context of the interprofessional foundational course**

Data collection of the pilot study was done in an IP foundational course within the IP pathway in the Fall term 2019 at the University of Alberta, Canada. The course title was "Foundations of Collaborative Practice". The objective of the course was to enable health professions students to develop the IP knowledge and skills that would prepare them to enhance IP relationships and knowledge exchange in future work environments. The instruction of IP

knowledge and skills in the course was established based on the Canadian Interprofessional Health Collaborative (CIHC, 2010) competency domains of IP Communication, Team Functioning, Interprofessional Conflict Resolution, Role Clarification, and Patient-centred Care. This foundational course was mandatory for students across the health sciences programs, including 851 students within 13 professions. The duration of the course was 6 weeks. The foundational course contained one online module (4 weeks) and two face-to-face sessions (2 weeks). The online session included the completion of readings, watching videos, and quizzes about basic knowledge of IP collaboration. Each face-to-face session included a CBA.

Most of the enrolled students were studying in the first year of their professional programs. The IP foundational course considered that the novice students might not arrive with detailed knowledge about their own professional roles or others' roles, so the course expected students to develop “transferable behaviours” rather than clinical skills. For example, it was intended that students understood and applied the basic strategies for promoting IP communication, team functioning, and conflict resolution; but the course did not expect a student team to deeply understand others' professional roles and responsibilities, the competency domain of “Role Clarification” was adapted to “Team Roles Clarification”. Team roles included the initiator, timekeeper, recorder, and general participants in an IP team. In the online module, students learned the responsibilities of each role, and students in a team were assigned to a role randomly in every CBA. Students were expected to learn about the IP role clarification in future elective courses and placements. Regarding other competencies – IP communication, team functioning, and conflict resolution, the course followed the definition and information of these competencies in the CIHC framework to develop the intended learning outcomes, course content, and assessments.

### ***1.1 Two assessments involved in the foundational course***

Of the two CBAs, one was scenario-based, and another was simulation-based, with 53 facilitators in each CBA. The objective of the scenario-based CBA for students was to demonstrate openness to ideas in discussion and decision-making, communicate and receive feedback from team members and incorporate into the team and individual performance, identify sources and impact of conflict and reflect to intentionally and routinely improve team function. The theme of the simulation-based CBA was Harm Reduction, which guided students to practice (in simulation) patient engagement in team care, demonstrate attitudes and behaviours that build a culture of

inclusivity, mutual respect, and trust, and support positive team functioning and relationship building through appropriate collaboration skills. The students completed the simulation-based assessment a week after the scenario-based assessment.

Regarding the scenario-based CBA, six to seven students from varying professions formed a team, 138 teams in total. Six student teams were assigned to stay in a single classroom, and three facilitators stayed in each classroom. Three written scenarios were provided to each student team. Each scenario had 20 minutes to complete – 10 minutes for student discussion and 10 minutes for student reflection and facilitator debriefing. A facilitator was responsible for observing two team performances in a classroom, writing feedback on a single-point rubric during observation, and debriefing.

Regarding the simulation-based CBA, standardized patients (SPs) were invited. Two original student teams from the last CBA merged into a big team, so each team had 12 to 14 students, and there were 69 big teams. Three big teams sat inside a single classroom. A team had to interview an SP in three rounds. In each round, the SP would come up with varying issues; three different students in a team volunteered to be interviewers, and other students acted as observers. Every team had 35 minutes to complete each round – 10 minutes for prior discussion, 10 minutes for interviewing the SP, and 15 minutes for student reflecting and facilitator debriefing. A facilitator was responsible for staying at a team in the entire assessment for observation, writing feedback on a single-point rubric, and debriefing. Because many students enrolled in the foundational course, each CBA had four different dates to be administrated.

## **2. Methods**

### ***2.1 Study design and inclusion criteria***

This study consisted of a descriptive cross-sectional design. We collected data at a single time point, and there were no comparison groups. The inclusion criteria were participants from the three populations – students, facilitators, and course developers – who were the stakeholders in the foundational course. This study did not have exclusion criteria within the course stakeholders.

## **2.2 Data source**

The data source of the validity evidence was the qualitative data from stakeholder interviews and the completed single-point rubric and both quantitative and qualitative data from the stakeholder surveys.

## **2.3 Developmental procedures and the application of the single-point rubric**

Course developers, my supervisor, and I worked as a group to develop the single-point rubrics. First, course developers created the intended learning outcomes of the foundational course and determined which learning outcomes aligned with the online module and each CBA. Then, I embedded those intended learning outcomes aligned with each CBA into the single-point rubrics. The descriptions of the intended learning outcomes of the course were somehow broad, so I made the performance criteria on the single-point rubrics more specific and understandable for students and facilitators. For example, one of the learning outcomes of IP communication aligned with the scenario-based CBA was “Describe and apply strategies to confirm understanding of others”. Because the “strategies” sounded too extensive, facilitators and students may not comprehend what the strategies were and how applying those strategies to confirm understanding would look like. Therefore, I revised this learning outcome to “The team used a positive tone of voice or body language. If jargons were used, the team clarified them and ensured that other members understood. The team members act as both active listeners and idea contributors,” on the single-point rubric for the scenario-based CBA. Those strategies such as using a positive tone, avoiding jargon use, and active listening were from the topics of the online module.

Next, the drafted single-point rubric was shared with the course developers for review. Both course developers and I modified the wordings of the rubrics based on the whole group suggestions to make the descriptions shorter and create bullet points for easy reading. The same process happened while developing the single-point rubric for the simulation-based CBA. Finally, the entire group came together to ensure the alignment between the performance criteria on the rubrics and the expected learning outcomes of the foundational course, whether the rubrics fit the intended use within validation, and whether the rubrics were suitable for the CBAs. The group had a consensus before the use of the single-point rubrics.

Regarding the structure of the single-point rubric, every rubric contained three parts: the first was a table with the performance criteria and Delta and Plus columns, the second part was for writing overall feedback regarding performance strengths and areas for improvement, and the final was a global rating section. The Delta-Plus section was used to comment on what and why a team did well or not, referencing to the documented criteria. Normally, a section to make judgements on performance strengths and weaknesses is the basic component of a single-point rubric. The course developers labelled “Delta” and “Plus” on the columns because they previously used these labels to build checklists for IP assessments, so we decided to keep them. As for the overall feedback section, facilitators could point out the key feedback written in the Delta-Plus section and/or write feedback on the competencies outside of the proposed competencies. For example, the single-point rubric used in the scenario-based CBA contained competencies such as IP Communication and Team Functioning, if a facilitator wanted to comment on a performance related to an additional competency like ethics, they could note that on the overall feedback section. Regarding the global rating section, facilitators gave a score out of 5 depending on team performance. This section provides another perspective on team performance. In this research, I mainly focused on the qualitative data on the rubric (Delta-Plus, overall feedback section) and did not analyze the numeric ratings. The global ratings will probably be analyzed in a future study. Subsequently, I developed a single-point rubric with four competencies for the scenario-based CBA and another single-point rubric with five competencies for the simulation-based CBA (Appendix B & C). I did not add Patient-Centred Care in the scenario-based CBA because no SPs were involved in that session.

Before the CBAs, students could view the rubrics in eClass so they knew the performance criteria beforehand for preparation. An orientation for using the single-point rubric was shared with all the facilitators over email, and the facilitators were required to view the orientation with principles of using the rubric in advance. The orientation was developed referring to the Frame-of-Reference training approach. I embedded videotaped scenarios illustrating outstanding, satisfactory, and unsatisfactory team performances extracted from the previous CBAs in the IP foundational course. Facilitators were informed of what appropriate feedback should be for each scenario, and examples for feedback writing in the orientation were shown. For instance, if a student team met all performance criteria in a competency, facilitators did not need to write feedback on the Delta and Plus columns; if a student team unmet the performance criteria,

facilitators should write what performance satisfied the criteria on the Delta column with a direct suggestion for improvement; and, if a student team exceeded the criteria, facilitators should indicate what the performance was and why the performance was outstanding on the Plus column. In the end, facilitators were asked to write overall feedback regarding performance strengths and areas for improvement in the second part of the rubric and then gave a score out of five at the final global rating section.

There were four principles to give feedback on the Delta-Plus columns and the overall feedback section: focus on student actions; explain why things go well and suggestions for improvements; be positive, respectful, and specific (Avoid giving comments like “Excellent!” or “Good!”); use understandable words for students. Of note, because the course developers did not ask facilitators to return the rubric with feedback to students, some facilitators might not complete the entire rubric; if only one section – Delta-Plus, overall feedback, or global rating – of the rubric was done, I defined the rubric as “half-completed”.

#### ***2.4 Student, facilitator, and course developer survey and focus group/interview***

Appendices D and E contain the content of student and facilitator surveys. Appendices F, G, and H show the procedures and questions for the student, facilitator, and course developer focus groups/ interviews. A survey, focus group, an interview that lasted about 5 minutes, totaling 60-70 minutes, 20-30 minutes to complete, respectively. Before the implementation of the survey and focus group/ interview, participants had to read the information letter and give consent. Participants’ responses and opinions were primarily interpreted to identify the validity evidence for supporting the IUAs and explore the educational impact of using the single-point rubric in the CBAs. The synthesis and interpretation of the validity evidence associated with the Implications and Scoring inferences are described in 3.2 and 3.3 of this Chapter. The exploration of the educational impact of using the single-point rubrics is discussed in Chapter 5 with the findings in Chapter 4. Because this was a pilot study, some questions within surveys and focus groups/ interviews were related to the understandability and reasonableness of described criteria on the rubric for the course. These additional findings are presented in 3.4 of this chapter.

## ***2.5 Research procedure and data analysis***

The entire pilot study consisted of four steps of validation; Figure 2 contains the validation process using Kane's validity framework. The first step was to propose the Interpretation/Use Arguments (IUAs) and then construct and plan the assessment and instrument corresponding with the IUAs. The proposed IUAs were first described in Chapter 1-2; the assessment plan was presented in 2.1 of this chapter, and the development of the instrument, the single-point rubric was portrayed in 2.3 of this chapter. The second step was to prioritize the most questionable or important inferences (e.g. Scoring, Generalization, Extrapolation, and Implications) for testing. I decided to prioritize the Implications inference and then the Scoring inference. Because the objective of this thesis was to study to what extent, the single-point rubric supported student learning and constructing feedback within the context of IPE, and the Implications inference emphasizes the consequence and impact of an assessment (Cook et al., 2015). Therefore, the purpose of the thesis primarily aligns with the core of Implications inference. The third part is to establish a plan and determine the source of validity evidence to analyze the IUAs that link with the key inference categories. Table 3 contains a summary of the IUAs, the sources of collected validity evidence, and associated analyses. Section 2.2 and 2.4 of this chapter consists of the data source and the data collection materials, stakeholder survey and focus group/interview. The final step is to analyze the collected validity evidence and formulate the final validity arguments. I will interpret and analyze the validity of evidence collected from the foundational course in the next section. After analyzing the validity evidence in both the foundational and elective courses (presents in 4. Findings of this chapter and the next), I compared the overall findings to the proposed IUAs and formulated final validity arguments demonstrating whether the IUAs were supported, rejected, where gaps exist, or what corrections to the assessment procedure might be essential (Kane, 2012; Tavares et al., 2018). The evaluation of the validity evidence and formulation of the final validity arguments will be discussed in Chapter 5-2.

The procedures of the data collection were: First, I had collected all the single-point rubrics used in the two CBAs. After that, I sent the facilitator and student survey links to a course developer, who helped me send the online surveys to all the students and facilitators through eClass after three weeks of the last CBA. Survey reminders were sent once a week, over two weeks. At the end of the survey, a question asked respondents' willingness to share opinions on the use of



the single-point rubric in a focus group or an individual interview. Additionally, I recruited course developers for participating in focus groups/ interviews over email. My plan was to conduct a focus group of at least 6 participants in each population (students, facilitators, course developers) where every focus group would have between 6-8 participants. If less than 6 participants could attend a focus group, I would conduct individual interviews instead. Participants had an option to choose telephone interviews instead. The places for all focus groups/ interviews were quiet and private. The entire conversation in the focus group/ interview was audio-recorded and transcribed verbatim by using Transcript Heroes Transcription Services.

The data analysis process of the thesis: The quantitative data from the survey was descriptively analyzed by using Excel. As for the qualitative data from the surveys, interviews, and completed rubrics, I applied the protocol of thematic analysis which was a six-phase approach developed by Braun and Clarke (2006). The six phases are (a) familiarizing yourself with the data, (b) generating initial codes, (c) searching for themes, (d) reviewing potential themes, defining and naming themes, and (f) producing the report. First, I was the interviewer to speak with all interviewees, I have immersed myself in the data by involving myself in the conversation, listening to the audio recordings after interviewing, and read the transcriptions; as for the qualitative data from the surveys and rubric narratives, they were organized using Excel for the convenience to review and analyze. Second, I generated codes which were relevant to the research question from the interview, survey, and rubric data, the codes were highlighted in different colours corresponding with the specific proposed IUAs. Then, I started to make up of the potential themes by analyzing some of the coloured codes associated with an IUA, next I continued to review the remain codes to test whether the initial themes were plausible. Afterward, the themes corresponding with every IUAs were defined, and they were reported with relevant qualitative data in the following section.

### **3. Findings**

#### ***3.1 The completion of the single-point rubric***

With 138 teams and 69 teams in the scenario-based and simulation-based CBA, respectively, I received 132 single-point rubrics back after the scenario-based CBA and 87 rubrics back after the simulation-based CBA. Since each CBA has three rounds, the course developers

requested the facilitators to write feedback for one-round observation for a team on a single-point rubric. Therefore, I expected to receive 138 and 69 single-point rubrics. However, the use of the rubric varied among facilitators; some facilitators used three rubrics to write feedback for each round in a CBA, when some provided overall feedback for two- to three-round observation on one rubric. Also, some facilitators did not give back the rubric in the scenario-based CBA. Of the 219 collected rubrics, 187 rubrics (85.4%) were completed, which meant all sections of the rubric, the Delta-Plus part, overall feedback area, and the global rating – containing narrative feedback and a rating. These 187 rubrics included those rubrics without feedback on the Delta-Plus part because when a team satisfied all the criteria, the facilitator did not need to write feedback on the Delta-Plus section, but the overall feedback section and global rating must be filled to be counted as a "completed" rubric. Of the 32 half-completed rubrics (14.6%), 24 rubrics (11.0%) involved narrative feedback on the Delta-Plus section but the overall feedback section and the global rating remained blank, and 8 rubrics (3.6%) contained a global score but no narrative feedback was written on any sections. Perhaps, it was because the facilitators were not required to deliver the rubric with feedback to students after the assessments, so some facilitators might not be aware to write feedback or perhaps solely viewed the criteria on the rubric as directions for debriefing.

### ***3.2 The characteristics of participants who completed the survey and interview***

Of 42 students and 14 facilitators who completed the survey, 2 students and 3 facilitators gave consent to participate in the interview. Also, two course developers were interviewed. I did not conduct focus groups because the participants in each population were less than 6. Table 3 shows the characteristics of the participants. Students who completed the surveys were from 9 out of the total 13 professions, with 60% of females and 37.5% of males. The two student-interviewees were from Speech-Language Pathology (50%) and Nursing (50%). Facilitators from 5 varying professions responded to the survey, with 78.6% of females and 14.3% of males. Facilitators were either academics or clinicians. Including the assessing experience in this course, most of the facilitators (71.4%) had been an assessor in IPE curricula once to twice; the others had 3-4 times. Two course developers attended in the interview had been an assessor in IPE more than 4 times but did not take part in examining students in this foundational course. Both the course developers contributed to the development of the single-point rubrics.

### ***3.3 Evidence for the IUAs associated with the Implications inference***

The IUAs for the Implications inference were: (1a) Facilitators could provide structured and helpful feedback by using the single-point rubric. Students agreed with the feedback and were able to identify their strengths and weaknesses. (1b) After engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning. Table 4 presents a descriptive analysis of the quantitative survey data, which was organized using Excel. The themes of the qualitative data linked with each IUA are shown below.

**3.3.1 Evidence for whether facilitators could provide structured and helpful feedback by using the single-point rubric.** Regarding the first part of the 1a IUA – “facilitators could provide structured and helpful feedback by using the single-point rubric”, 92.8% of facilitators subjectively estimated that their written feedback was structured and helpful, shown in the survey results. The interview outcomes presented a similar finding, facilitator-interviewees particularly described how the single-point rubric assisted them to provide structured and helpful feedback. One of the reasons was the blank Delta-Plus section allowing facilitators to write feedback regarding a team’s strengths and weaknesses. Also, the rubric format did not place the boundaries on performance compared to a checklist style, so facilitators did not have many restrictions while writing feedback.

Structured, yeah I think it (the feedback) was structured because when I was giving feedback it was easy for me to tell them that you need to work on this and you could have done better on this and I like how you did this one so yeah it was easier to give feedback.  
(Facilitator 2)

I think it was (structured and helpful) ... Because it (the rubric) was very clearly laid out what we were looking for. I appreciated that they put it in the plus delta format. So rather than – the last time the issue I had with the checklist was that if somebody did something partially well but they didn’t do it well then with the checklist it was harder to indicate that. Whereas with the checklist it’s very clearly laid out, you can put in this column right there went well and on this side what can be improved. So then you can put both sides of the feedback right in there. And then the students don’t look at it as oh, we missed checking

off this box it's no, here's where you do well and here are some areas for improvements.  
(Facilitator 1)

Both course developers had additional perspectives on whether facilitators could write structured and helpful feedback to students by using the single-point rubric. They considered the provision of good feedback likely depending on a facilitator's experience and training ahead of course, not only depending on the use of a specific type of rubric.

...they would have been familiar with kind of more or less what these areas mean based on not just the training about this particular rubric but just the overall training that this is what this course was about, they would have heard some of these things before, you know. And so they're slowly starting to get a mental image about what we mean by team functioning or interprofessional communication. So it's part of the subject area of the course. So I feel like hopefully it (the rubric) gave them a reasonable idea about what they're expecting to see in terms of good performance. (Course developer 1)

I think they would need some help if you were a new facilitator and not really clear about feedback because I don't know if somebody who's inexperienced could easily take some of the points and turn that into feedback. So, again maybe if they looked at the materials then it would have been easy for them to do it but if you don't look at the materials and you're not used to giving feedback this may not help you. But that's not to me a criticism of the rubric, I think that's more about if you don't do the training then of course you don't know how to provide the structured feedback. (Course developer 2)

In addition, I had reviewed the completed rubrics to examine the structure of the narrative feedback. Within the 187 completed rubrics plus the 24 rubrics with narrative feedback on the Delta-Plus area, most of the feedback formatting style was a list of bullet points or a couple of short sentences. Appendix I shows an example of a completed single-point rubric with feedback. However, a few rubrics contained non-specific feedback such as "Good ideas", "Too quiet", "Good discussion", and "Too early", which might not be comprehensive and helpful for students to identify their capacities. Of note, the orientation of using the single-point rubric mentioned avoiding to give feedback such as "Excellent" and "You did bad" because they are not specific

and explicit to let the students know what their performance looks like and why they get such judgement.

**3.3.2 Evidence for whether students agreed with the feedback and were able to identify their strengths and weaknesses.** Regarding the second part of the 1a IUA, “students agreed with the feedback and were able to identify their strengths and weaknesses”, student-interviewees found that the structure of the rubrics could help identify their strengths and weaknesses. Again, because students did not receive a copy of the rubric with written feedback after the assessments, so they reflected less in this part.

Having structure definitely helps because it would – it's like reading tick charting versus reading long hand charting, right? Having structure makes it easier to find exactly what you need instead of having to sift through everything. (Student 1)

Yeah, I like how they split it (Delta & Plus) up giving us more room to kind of elaborate. (Student 2)

**3.3.3 Evidence for whether students could perceive directions for improvement in future IP learning after engaging with the narrative feedback on the rubric.** For the 1b IUA, “after engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning”, student-interviewees reckoned that the written feedback might help for future learning, as long as students engaged with the feedback or facilitators gave more clear guidance.

I think it would help everyone if they took the time to think about it. I think the facilitators can only do so much and it's up to the person who receives the feedback to actually implement it. (Student 1)

If they (the facilitators) gave me more pointers on how to word what I was trying to convey or how to engage more maybe, that would be helpful. (Student 2)

Furthermore, 92.8% of facilitators claimed their confidence in offering written feedback to students, and they hoped that students would use those feedback to regulate performance in another assessment.

I would like to see them incorporate that in their next face to face whether individually or in the team. (Survey response)

I would like to see an additional opportunity to evaluate the students in order to observe growth based on the feedback. (Survey response)

Also, two facilitator-interviewees reported that the feedback on the rubric could give students the direction to plan for improvements and potentially motivate students in future IP learning. Because the rubric format could help articulate the pros and cons of team performance, so students would have a direction to motivate themselves in future learning.

... the fact that they're looking at both strengths and weaknesses then it gives the students a really good balance of okay, here's where you did really well and these are the specific things and specific behaviours that you need to improve upon. (Facilitator 1)

...because it's a category that helps in knowing what they need to work on and what they have already achieved and things like that. (Facilitator 3)

In contrast, a facilitator-interviewee reckoned that the feedback may be helpful but unlikely gave clear guidance for improvements because they had less time to write everything. Also, they found that the feedback fell short to enhance student learning because students had not realized their roles clearly in a team yet, so feedback would be more helpful when students are more experienced in collaborative practice or when students work in a real-life setting.

There wasn't a lot of time so I didn't have a lot of time to write everything, like I was really just kind of doing shorthand notes if that makes sense. (Facilitator 2)

I think some of them really found that it was a difficult situation because they didn't fully understand what their roles were because it was all brand new for them. And so it was kind of very artificial scenario for them... it would be more helpful to have feedback when they're actually in – maybe a couple of years in and actually know what their roles are, know what the roles of everybody else is and have a real conversation, interdisciplinary conversation about a real subject if that makes sense. (Facilitator 2)

Moreover, a course developer determined whether the feedback on the rubric could support learning did not solely depend on the rubric itself, it was more related to facilitators' ability in giving feedback.

...if the facilitator's able to, you know, observe the teams and able to come up with feedback under these areas I think it would help the students. That in itself is, you know, it's not the rubric itself but some facilitators still find it a challenge to think about these content areas, that's a challenge no matter what type of rubric you're using or whether you're using a rubric at all. (Course developer 1)

### ***3.4 Evidence for the IUAs associated with the Scoring inference***

The IUAs for the Scoring inference were: Facilitators followed the orientation principles to use the single-point rubric, wrote feedback referencing the criteria on the rubric, and captured main aspects of performance within a competency. Overall, 92.8% of facilitators subjectively believed that they followed all the orientation principles while using the single-point rubrics; 100% of them claimed that they compared the criteria on the rubric in the team observation to write feedback and could identify how the expected performance looked like, shown in the survey results. Accordingly, facilitator- and course developer- interviewees agreed that facilitators could easily identify the criteria in team performance by using the single-point rubric.

I took a look at here's the demonstration of competency so to me this was the minimal expectation. So in terms of from when you were look at say on the back here when they asked about the team performance to me expected – so that would mean that they had met all of these criteria, outstanding would mean that they had gone beyond the bare minimum. But I think that it was very well laid out in terms of what we were supposed to be looking for, what we were supposed to mark them on was very clear to me. (Facilitator 1)

...when I look at the first competency, with the communication, speak clearly audibly, that's very straightforward. Use positive tone of voice, body language. Again, I've got a very good understanding, I mean you're demonstrating to me really good positive tone and body language right now, clarifying jargon or ideas are understood. So yeah, I think it's laid out so that it's quite specific in what the expectations are with probably room for if

they demonstrated more advanced competence than you could write that down. (Course developer 2)

To collect more evidence to determine whether the facilitators wrote feedback based on the orientation principles and referencing the criteria on the rubric, I examined the completed rubrics with narrative feedback. First, I found that all facilitators provided feedback in the right place. For example, the team strengths were described in the Plus column, and the team weaknesses were illustrated in the Delta column. However, though 92.8% of facilitators deemed that they followed all the orientation principles while using the single-point rubrics, I questioned that after analyzing the completed rubrics. First, the written feedback from some facilitators was overlapped with the criteria. For instance, one of the criteria of IP Communication was “Use positive tone of voice/body language”, and a facilitator wrote “The team used positive tone” on the Plus column, but one of the rules of using a single-point rubric was that it was not necessary to write feedback on either column if a team satisfied the criteria. I was wondering if some facilitators did not understand how to use the single-point rubric, or they did not pay attention to and follow the orientation principles. Relating to this assumption, 7.14% of facilitators in the survey disagreed that the rubric was easy to use and did not understand how to use the rubric, even after watching the orientation.

Second, I discovered that one principle was not sufficiently adopted while facilitators wrote feedback on the Delta column, which was to provide suggestions for improvement. All facilitators followed most of the principles, but many of them did not offer specific suggestions for the areas needed improvement. For example, a facilitator may first write the team actions they observed, such as “the team asked the patient to do a few tests but did not explain clearly what those tests are about” in the area of IP Communication, then they should illustrate a suggested act associated with this observed performance, such as “next time, the team can clarify the jargons and make sure the team members and the patient understand the plan” However, many the facilitators did not write feedback in this mode, as they only wrote what did not perform well but without specific guidance for improvements. Correspondingly, 14.3% of facilitators responded to the survey that they did not give a specific suggestion to the student team. Possible reasons were that they were not familiar to do so as 71.4% of the facilitators had limited experience as an IP assessor, or it was



because the facilitators believed they did not need to provide narrative feedback to students, so they were not aware how to write clear suggestions on the rubric.

Regarding whether facilitators captured main aspects of performance within a competency, I examined the narrative feedback and summarized the findings. Overall written feedback matched with the content of each competency, no significant feedback was written on an irrelevant competency. For instance, feedback about Team Functioning was not written on other competency rows like Team Meeting Roles. In addition, some facilitators wrote feedback on the overall feedback section that was not related to any competency on the rubric. For example, a facilitator articulated comments regarding professionalism in that section. And, it was an intent that I designed the overall feedback section for facilitators to make comments on the non-documented competencies.

### ***3.5 Additional findings***

The surveys and interviews contained questions regarding the understandability and the reasonableness of the described criteria in the rubric for the foundational course. Most of the students agreed that the criteria were comprehensive and reasonable for the course. However, 8 out of 41 students (19.05%) in the survey disagreed that both the criteria of Team Functioning and Team Roles were legitimate for the course; 3 students (7.14 %) strongly disagreed and another 3 students (7.14 %) were not sure that the criteria of IP Conflict Resolution were reasonable for the course. Moreover, 6 students (14.29%) disagreed, 1 student (2.38%) strongly disagreed, and 3 students (7.14%) were not sure that the course content covered all the competencies presented in the rubric. Interestingly, the course developers, my supervisor, and I worked together to confirm the consistency of the intended learning outcomes and the rubric criteria before using that. I assumed that perhaps the learning materials in the online modules were not enough to instruct and prepare students to attain the intended learning outcomes of competencies. Nonetheless, all the facilitators acknowledged the comprehensiveness of the criteria in the single-point rubrics. Besides, the facilitators thought that the rubric was easy to apply, below shows one example.

It was easy for me to tell them that you need to work on this and you could have done better on this and I like how you did this one so yeah it was easier to give feedback. (Facilitator 3)

Additionally, regarding the preference for receiving narrative feedback, students had varying viewpoints. The results of the student survey showed 64.3% of students were keen on receiving the narrative feedback, whereas 35.7% preferred not to get the narrative feedback. For those who wanted the narrative feedback, they found it beneficial to collect and use feedback for future improvement. For those who did not want the narrative feedback, they explained because they already had a busy schedule so perhaps verbal feedback was well enough, and one student expressed that the assessment content may not relate to their profession.

In addition to reviewing the feedback and considering the facilitator's observations and comments, it would be useful to keep as a document I can refer to in the future to remind myself of the experience and the feedback we received. (Survey response, preferring on the narrative feedback)

I would have used it (the feedback) as a way to improve my team's functioning in the future and as a source of self-reflection. (Survey response, preferring on the narrative feedback)

No, I don't need written feedback – I think that if the teams spend a few minutes speaking to the facilitators about their performance, it would lead to a constructive discussion as opposed to just reading the comments off of a sheet of paper. (Survey response, not preferring on the narrative feedback)

Too busy to deal with it, and the course simulation was not really related to my field of study anyways. (Survey response, not preferring on the narrative feedback)

With the same questions, both student-interviewees preferred narrative feedback:

I think personally for me I would prefer the rubric and follow it up by the narrative feedback... because like when you're throwing out narrative feedback most people don't really talk in structure, right, you talk in a free flowing way so when you're giving feedback it can fall in any category technically... But that's just me, other people might prefer differently. (Student 1)

Personally, I feel like maybe getting the written one would be better for me just because I find I take information in better maybe with a written copy. But for other learners maybe having that discussion-based feedback would be better. (Student 2)

A course developer regarded that the single-point rubric would be more suitable for a small-scale class instead of a large-scale course. They assumed that if facilitators had knowledge of the students and had more time to prepare the assessment and write feedback, it would benefit the use of the single-point rubric.

...maybe has a smaller class and is trying to assess maybe written work that students have done and that the student, the professor or teacher knows those students and has more time to think about, you know, maybe reading something and more time to think about what the feedback would be. So to me that would make more sense that you've got a small group of people and you can really spend a lot more time before you're doing whatever OSCE (Objective Structured Clinical Examination) or whatever activity it is. And everybody will be quite clear and quite able I think to write down a feedback and I think it'll be important to do that. (Course developer 1)

Another course developer suggested creating more narrative criteria than bullet point criteria. For example, we used a bullet point criterion such as “spoke clearly/audibly” in the area of IP communication, but this criterion lacked adequate information about how speaking clearly/audibly meant in a team. A narrative criterion like “I spoke clearly and audibly. The language was free of jargon; if jargon was used, the terms were clarified for teammates” could let both facilitators and learners identify the meaning of “spoke clearly/audibly”.

I mean I would be curious to try it with more narrative and not bullet points. I would be curious to see how that would be received by facilitators who were really thoughtful, reflective, did the training, really open to a new approach... It gets away from that reductionistic perspective which maybe it's a philosophical question or discussion to have with facilitators or with the coordinating team around well, what is meaningful feedback that we want students to walk away with? ... so I would be really curious to try that narrative piece so it's more holistic rather than this potentially reductionistic. (Course developer 2)

#### 4. Summary

Some of the collected rubrics were half-completed, indicating only one or two sections of the rubric was done. I assumed that was because the facilitators were not asked to render the rubric with written feedback to students, so some of them did not pay attention to provide feedback and just delivered verbal feedback.

Summarizing the validity evidence for the first part of 1a IUA, “Facilitators could provide structured and helpful feedback by using the single-point rubric”, facilitators subjectively reckoned their written feedback being structured and helpful for students, because the Delta-Plus format assisted them to construct the feedback. Student-interviewees also pointed out that the rubric format could help facilitators write structured feedback to them. While course developers explained the provision of structured and helpful feedback not only relying on the rubric format, but also the training intensity and assessing experience of the facilitators. Through reviewing the completed rubric with written feedback, the narrative feedback was usually short sentences and organized with bullet points. However, few facilitators made non-specific comments such as “Good discussion” and “Too quiet”, which might not be helpful enough for students to recognize their capacities. In summary, the single-point rubric could assist in formulating structured feedback, but whether it could benefit from providing helpful feedback was affected by other factors like experience and training level of the facilitators. Also, a few facilitators failed to provide specific feedback.

The validity evidence for the second part of 1a IUA, “Students agreed with the feedback and were able to identify their strengths and weaknesses”, showed that the structure of the rubric, especially the Delta-Plus section could likely enhance the identification of performance strengths and weaknesses. But, because students in the foundational course did not receive the narrative feedback, so more relevant validity evidence will be described in the next chapter.

In terms of the 1b IUA, “after engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning”, student-interviewees thought that the feedback could guide future learning as long as students consciously used the feedback, and facilitators gave clear guidance. Facilitators had various perspectives. While most of the facilitators agreed that the structure of the single-point rubric could assist students to perceive areas

for improvement easily, a facilitator considered that they had no enough time to write sufficient feedback during the CBAs, and students might need more experience to comprehend some of the key concepts used in collaborative practice. Also, a course developer considered that the capacity of facilitators to give useful feedback mattered for students to apply those feedback in guiding future learning. I would like to learn more validity evidence for the 1b IUA from students' perspectives; however, students did not receive the narrative feedback after CBAs and reflect on it. In the next chapter, I will gather more students' perspectives related to this IUA. To conclude, when facilitators provide clear and useful guidance on the feedback, and students engaged with the received feedback and use it, it possibly helped students to identify the direction for improvement in future IP learning.

For the second IUA, "Facilitators followed the orientation principles to use the single-point rubric, wrote feedback referencing the criteria on the rubric, and captured main aspects of performance within a competency", there was a little inconsistency between facilitators' subjective reflection and my observed pattern on the completed rubrics. According to the survey outcomes, about 93% of facilitators thought that they followed the orientation principles to write feedback, and 85.7% claimed to have provided specific suggestions on the rubric. But I noticed that many facilitators did not provide suggestions associated with their observed team weaknesses. Looking back to the validity evidence assembled in the 1b IUA, Student 2 expressed that the feedback could offer directions for improvement as long as facilitators provided more pointers. Therefore, it might be necessary to offer clear suggestions to support learning, while this is one of the principles of using the single-point rubric. Except for this issue, most of the facilitators worked well with the rubric to write feedback referencing the criteria and captured main aspects of performance within a competency.

Additional findings of the understandability and reasonableness of the rubric criteria were that, most of the students acknowledged that the overall criteria were understandable and reasonable for the course. Yet, about 20% of students disagreed with the legitimacy of the criteria of Team Functioning and Team Roles for the course. 17.07% of students either strongly disagreed, disagreed, or unassured that the criteria of IP Conflict Resolution were reasonable for the course. The possible reasons were that the learning materials in the online modules were not sufficient to instruct students to achieve the rubric criteria (i.e. intended learning outcomes) related to the

competencies described above, or the assessment context did not allow students to perform the expected performance described in the rubric criteria. If the teaching activity and assessment plan were somewhat inconsistent with rubric criteria, it is speculative whether the constructive alignment of the whole course is enough.

Because students received verbal feedback in debriefing, there was an additional intent to know their preferences in gaining either verbal or narrative feedback. I found that most of them preferred to have a copy of the rubric with written feedback, while some of them did not with personal reasons. A course developer suggested that the use of the single-point rubric suited in a small-scale class, because facilitators would be able to spend more time to arrange the assessments and write feedback. Moreover, another course developer recommended to apply narrative criteria other than bullet point criteria, to make the criteria more integrated and possibly enhance the provision of meaningful feedback, and I took this suggestion to modify the single-point rubrics applied in the elective course.

#### **Chapter 4 Developing and piloting the single-point rubric in the elective course**

Chapter 3 contained the collected evidence supported the ability of the single-point rubric to assist facilitators in providing structured and potentially helpful feedback, while facilitators' experiences and training intensity might affect the capability to write helpful feedback. Also, the findings in the previous chapter suggested that students could likely gain directions for further improvements. But the evidence might not be enough to support the assumption that "After engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning" (1b IUA), because students did not receive the narrative feedback in the foundational course. Students would have an opportunity to receive narrative feedback in the elective course, so that more evidence could support 1b IUA associated with the Implication inference. Additionally, many facilitators in the foundational course had followed all the principles of using the single-point rubric, but one of the principles was always ignored which was to offer suggestions for the areas needed improvement. Also, some facilitators did not complete the entire rubric. A facilitator-interviewee claimed that they ran short of time to write feedback that may be one factor to affect the use of the single-point rubrics.

This chapter contains an explanation of the pilot study implemented in the IP elective course. Similar to the study conducted in the foundational course, single-point rubrics were developed and applied in the IP assessments. The research question of this thesis was: To what degree does the single-point rubric support student learning and facilitators to construct helpful feedback within the context of IPE? The primary objective was to collect and interpret validity evidence for the use of the single-point rubric in IP assessments. The validity evidence extracted from the survey and interview data and the completed single-point rubrics was interpreted to support the proposed IUAs associated with the Implications and Scoring inferences within Kane's validity framework (Kane, 2013) and would be further analyzed to explore the educational impact (i.e. support learning and constructing helpful feedback) of using the single-point rubric.

### **1. Context of the IP elective course**

The elective IP course with the title "caring for the head & neck oncology patient" was delivered in Winter 2020 at the University of Alberta, Canada. Twenty-six students enrolled in the course were from the Department of Physical Therapy, Radiation Therapy, and Speech-Language Pathology. The course aimed to help students develop collaborative competencies related to Role Clarification, IP communication, IP Conflict Resolution, Patient/Client/Family-Centred Care, and Collaborative Leadership from the CIHC framework (CIHC, 2010) within the healthcare context of head and neck cancer patient care.

The original plan of the elective course was to have two online asynchronous modules and two face-to-face sections that included a professional role presentation and a simulated-based CBA with SPs. The plan had changed because of the COVID-19 pandemic issue. The professional role presentation and the simulated-based CBA were cancelled, and it changed to a scenario-based activity with a care plan assessment. The online modules and assessments were originally framed by the CIHC competencies; however, the change of the assessment form affected the required competencies of the care plan assessment, while the online course content remained the same. The decided competencies that should be performed in the care plan assessment were Patient-Centred Care, SMART goals, and comprehensiveness. The competencies of SMART goals and comprehensiveness were involved in the topic of generating a good care plan in the online modules.

In summary, after the change of the original plan, this 5-week course included two online asynchronous modules and one online-delivered face-to-face session. The online modules (3 weeks) contained required readings and a quiz about IP treatment and collaboration for patients with head & neck cancer. The online face-to-face session (1 week) involved a scenario-based activity with a care plan assessment. At the end of the course, students had to self-assess their performance in the care plan assessment by using a single-point rubric. The final reflection assignment required students to reflect on both the self-assessment and care plan assessment results to analyze their performance in the course and plan for future actions (1 week).

### ***1.1 Two assessments involved in the elective course.***

The care plan assessment came after the scenario-based activity. The objective of the scenario-based activity was to allow students to work with other professions students and establish care plans for patients with neck and head cancer. The care plan assessment aimed to examine whether the decided care plans were patient-centred, comprehensive and followed the SMART goals. In this activity and assessment, 5 to 7 students from three health professions formed as a team, and there were 4 teams in total. A team was required to watch two patient videos, discuss the patients, and determine the care needs, and finalize two care plans subsequently. Each patient discussion took an hour. At the end of each discussion, students were asked to work on a care plan for the patient and then hand in the two written care plans within a week. Four facilitators used two single-point rubrics to assess and write feedback for the two care plans submitted from a team, then facilitators uploaded the rubric with written feedback to each student team in eClass.

Regarding the self-assessment, students had to use another single-point rubric to examine their IP team performance in the scenario-based activity and care plan assessment and then write feedback for themselves. In particular, every student was required to revisit the feedback offered by the facilitator in the care plan assessment and from the self-assessment to complete the final reflection assignment.



## **2. Methods**

### ***2.1 Study design and inclusion criteria***

Since we collected data at one time point, and there were no comparisons, this study aligned with the components of a descriptive cross-sectional study. The inclusion criteria were the two populations involved in the elective course, which were students and facilitators. Of note, facilitators and course developers were the same group of people. I did not set exclusion criteria within the students and facilitators within the course.

### ***2.2 Data source***

The data source of the validity evidence was the qualitative data from the student and facilitator interviews and the completed single-point rubric and both quantitative and qualitative data from the stakeholder surveys.

### ***2.3 Development, modification, and the application of the single point rubric***

Two single-point rubrics, one for facilitators to make judgements on the care plan and another for students to self-assess their IP performance, were developed. With the suggestions received in the foundational course, I changed the bullet point criteria to narrative criteria, to make the performance expectations more explicit and integrated. Similar to the foundational course, course developers and I worked as a group to discuss the criteria on the rubrics in advance to ensure the alignment between the criteria and the intended learning outcomes. The group advised to have a separate rating associated with a single competency and sum up all the separated rating as the global rating, so I made this change in the single-point rubric for the care-plan assessment. Also, the group deemed that the overall feedback section could be eliminated because the feedback on the Delta-Plus section might be enough to demonstrate the team strengths and areas needed improvements. A prior orientation for using the rubric was shared to all the facilitators beforehand, which was adapted from the orientation slides used in the foundational course. Students and facilitators could view the single-point rubric in eClass before the assessment.

Four facilitators (who were also course developers) employed the single-point rubric with three competencies – Patient-Centred Care, SMART goals, and comprehensiveness (Appendix J) to score and write feedback for the care plan submitted by each student team. In addition, I created

a single-point rubric with four competencies: Role Clarification, Team Meeting Roles, IP Communication, and IP Conflict Resolution, and three multiple-choice questions designed by Ten Cate and Chen (2016) for students' self-assessment (Appendix K). I adopted Ten Cate and Chen's three questions because they were simple for students to reflect on their own performance.

#### ***2.4 Student and facilitator survey and focus group/interview***

Appendices L and M show the content of student and facilitator surveys. Appendices N and O show the procedures and questions for the student and facilitator focus group/ interview. A survey, focus group, an interview took approximately 5 minutes, totaling 60-70 minutes; 20-30 minutes to complete, respectively. Before the survey and focus group/ interview administration, I asked participants to read the information letter and give consent. Participants' responses and thoughts were mainly interpreted to support the proposed IUAs and explore the educational impact of using the single-point rubric. The integration and interpretation of the validity evidence associated with the Implications and Scoring inferences are presented in 3.2 and 3.3 of this chapter. The exploration of the educational impact of using the single-point rubrics is described in Chapter 5 with the findings in Chapter 3. Because this was a pilot study, some questions within surveys and focus groups/ interviews were related to the understandability and reasonableness of described criteria on the rubric for the course. These additional findings were presented in 3.4 of this chapter.

#### ***2.5 Research procedure and data analysis***

I followed the validation process using Kane's validity framework (Figure 2) that contained four steps. First, I formulated the Interpretation/Use Arguments (IUAs) and establish the assessment and instrument corresponding with the pre-defined IUAs. The IUAs were described in Chapter 1-2; the assessment plan was presented in 2.1 of this Chapter, and the development of the single-point rubric was illustrated in 2.3 of this chapter. Second, I prioritized the most questionable and important inferences for testing. I decided to prioritize the Implications inference and then the Scoring inference, because the objective of this thesis was to study the extent of using a single-point rubric to support learning and teaching. The Implications inference focuses on the consequence and impact of an assessment (Cook et al., 2015); therefore, the aim of the thesis fits the essence of the Implications inference. Third, I established a plan and determined the source of validity evidence to analyze the IUAs that link with the key inference category. Table 3 contains

a summary of the IUAs, the sources of collected validity evidence, and associated analyses. Section 2.2 and 2.4 of this chapter consists of the data source and the data collection materials. Finally, I analyzed the collected validity evidence to formulate the final validity arguments. After analyzing the validity evidence in both the foundational and elective courses (presented in 4. Findings of both Chapter 3 and 4), I compared the overall results to the proposed IUAs and formulated final validity arguments determining whether the IUAs were supported, rejected, where gaps exist, or what corrections to the assessment procedure might be essential (Kane, 2012; Tavares et al., 2018). The evaluation of the validity evidence and the pre-defined IUAs will be discussed in Chapter 5-2.

The research procedure and data analysis were similar to the methods presented in Chapter 3. All the completed single-point rubrics were uploaded in eClass after each assessment. After one week of the course completion, I sent the online survey links to a course developer and ask them to help me send the online survey links to all the students and facilitators via eClass. At the end of the survey, there was a question for recruiting participants for a focus group/ an interview. Every focus group in a population would have 6-8 people. If less than 6 individuals in a population were available to participate in a focus group, we would have individual interviews instead. The meeting place for the focus group/ interview was a quiet and private conference room. If participants were not able to attend the focus group/ interview physically due to personal reasons, we would have a telephone interview alternatively. The entire dialogue in the focus group/ interview was audio-recorded and transcribed verbatim by Transcript Heroes Transcription Services.

The quantitative data from the survey was descriptively analyzed using Excel. I applied the protocol of thematic analysis which was a six-phase approach developed by Braun and Clarke (2006) to analyze the qualitative data from the surveys, interviews, and completed rubrics. The six phases are (a) familiarizing yourself with the data, (b) generating initial codes, (c) searching for themes, (d) reviewing potential themes, defining and naming themes, and (e) producing the report. The details of how I followed these six phases in the thematic analysis are shown in Chapter 3 – 2.5.

### 3. Findings

#### *3.1 The completion of the single-point rubric*

Every student team submitted 2 care plans, and there were 4 teams, so 8 single-point rubrics were applied to grade and make judgements on the care plans. All the single-point rubrics employed by the facilitators were completed. Regarding the self-assessment, 24 of 25 students submitted the self-reflection with the self-assessment results as the instructors asked them to do so, but 1 student did not key the self-assessment results with the final reflection assignment.

#### *3.2 The characteristics of participants who completed the survey and interview*

Of 7 students and 3 facilitators who responded to the survey, 1 student and 2 facilitators participated in the telephone interview. I did not operate a focus group because the participants in each population were less than 6. Table 3 summarizes the participant characteristics in the elective course. Table 5 shows the descriptive data of the surveys. 71.4% of respondents in the student survey studied in Speech-Language Pathology, while the others studied in Radiation Therapy (28.6%). 85.7% of the student-respondents were female. The student-interviewee was a female who studied in Speech-Language Pathology. The three facilitators who completed the survey were from Radiation Therapy (66.7%) and Speech-Language Pathology (33.3%). Of the three facilitator-respondents, one had IP assessing experience once to twice, one had 3-4 times, and the other one had been an assessor in IPE more than 4 times. The two facilitator-interviewees were both female and working in the discipline of Radiation Therapy, they had 1-2, 3-4 times assessing experiences, respectively.

#### *3.3 Evidence for the IUAs associated with the Implications inference*

The IUAs for the Implications inference were: (1a) Facilitators could provide structured and helpful feedback by using the single-point rubric. Students agreed with the feedback and were able to identify their strengths and weaknesses. (1b) After engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning. The themes found from the qualitative data associated with each IUA were presented below.

**3.3.1 Evidence for whether facilitators could provide structured and helpful feedback by using the single-point rubric.** In terms of the first part of the 1a IUA, “facilitators could

provide structured and helpful feedback by using the single-point rubric”, the survey results showed that all facilitators (100%) acknowledged the usefulness of the rubric for constructing helpful and structured feedback. A facilitator-interviewee deemed that giving a direct suggestion on the rubric to a student team would be more helpful. This was also one of the intended uses of the single-point rubric.

What I have written down was something like for example when it comes to the SMART Goals (one of the competencies) expectation and what we’re looking for, what I had written down was something like Goals formulation could be improved by stating this, this and this. So I think that a direct suggestion to the students as to what they need to change in order to reach that expectation. (Facilitator 1)

Additionally, all students (100%) agreed that the feedback from the instructor was structured and helpful for them to create a better IP care plans, shown in the survey results. Students used a single-point-rubric to self-assess their IP performance in the scenario-based activity. All students (100%) responded that the feedback written for themselves was structured and helpful to write the final reflection.

The student-interviewee credited that to the format of the single-point rubric.

Yeah, it was, because it ... directly related to the criteria of the demonstration of competency, like it was in a table and it was very clear what the instructor was talking about. (Student 1)

Moreover, I had reviewed the completed single-point rubric to investigate the structure of the written feedback. Facilitators constructed feedback on single-point rubrics within bullet points. Appendix P contains an example of how a facilitator used the rubric to grade and provide feedback to a student team in the care plan assessment. Different from the results in Chapter 3, facilitators in the elective course did avoid rendering non-specific feedback such as “Good ideas” or “Good discussion”. I assumed that facilitators had more time (a few days) to examine the care plans, while facilitators in the foundational course wrote feedback during the 10-minute observation. Also, facilitators in the elective course were the course developers who helped develop the single-point rubric, so they might be more familiar with the application of the rubric. Therefore, the duration

of time to provide feedback and familiarity with the rubric could affect the ability to offer helpful feedback.

**3.3.2 Evidence for whether students agreed with the feedback and were able to identify their strengths and weaknesses.** Regarding the second part of the 1a IUA, “students agreed with the feedback and were able to identify their strengths and weaknesses”, all students (100%) agreed the feedback from the facilitator accurately reflecting the quality of their care plans, shown in the survey results. The student-interviewee also agreed with that.

I feel like the written comments were in line with what we did. I can see how our goal was missing the timeframe... And yeah, I can see how there was disconnect between short-term goal and long-term goal, I can see that. (Student 1)

**3.3.3 Evidence for whether students could perceive directions for improvement in future IP learning after engaging with the narrative feedback on the rubric.** For the 1b IUA, “after engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning”, all students (100%) who completed the survey identified the helpfulness of the feedback for creating a better IP care plan in the future and providing direction to plan actions for improvement. While 85.71% of students agreed that the feedback could motivate them in future IP learning. The survey asked what students would do with the feedback given on both the care-plan assessment and self-assessment, and the outcome showed that the students inclined to use those feedback for further IP learning in specific areas.

Use this feedback to apply to my future interdisciplinary care plan work; considering referral to other disciplines was one that stood out to me. (Survey response)

I will seek out information and opportunities to improve my experience and understanding about specific roles! (Survey response)

However, the student interviewee considered that the feedback from the instructor was not enough to guide them for future learning, because the received feedback only presented their performance, both pros and cons, but lacked direct suggestions linked with the cons. They advised us to have a follow-up session.

... but this one just pointed out what, from my understanding, this one pointed out what wasn't completed like appropriately. Like "overall long-term goal is generic in nature" (a feedback written on the Delta column of the competency of Patient-Centred Care), but I'm not sure how to be not generic. Rich feedback would be like, for example, here's what you could do instead, so... I wouldn't say that it helped me to improve anything, it just told me like what I did and I didn't do. I feel like if there was maybe like a follow up session (Student 1)

A facilitator-interviewee recognized that the narrative feedback worked better for other assessments in a similar context. In other words, the feedback might work less well under other situations.

If they were doing something similar in another course, like developing a care plan, I think that would be helpful. And I think if we change the context or the, of what they were, how they were learning IP skills and then the required assignments, it may not be applicable, so. So, maybe yes and no. (Facilitator 2)

Another facilitator-interviewee believed that their feedback would assist students in promoting their competencies, but whether it worked would depend on students' engagement with the feedback. They expected if there were two assessments in the course, and then the feedback in this first assessment would work to motivate students in the later assessment.

I think my instructions are clear as to how they can improve, you know, if they were to work on this again in the next semester. Whether they read it or not, that's another story. (Facilitator 1)

I think – well maybe in the long-term it would have an impact but I would say that for the students to – if they have a formative assessment like say earlier on in the course, and then they have a feedback like this, I think they'll be more motivated. Because then there will be upcoming assessment so that they need to improve. (Facilitator 1)

### ***3.4 Evidence for the interpretation/use arguments associated with the Scoring inference***

The IUAs for the Scoring inference were: Facilitators followed the orientation principles to use the single-point rubric, wrote feedback referencing the criteria on the rubric, and captured main aspects of performance within a competency. All facilitators responded in the survey that they had followed the principles to use the rubric, and it was easy to compare the team performance against the criteria. Also, facilitators could easily identify the key features of performance expectations in a competency, shown in the survey results.

After reviewing the facilitators' completed rubrics, I found that all the facilitators mostly followed the principles and gave reasonable feedback on each competency. However, one to two feedback sentences were loose to provide clear suggestions for the team weaknesses that happened in a facilitator. As I have mentioned the same issue in the last chapter, we required facilitators to provide clear guidance to students associated with the areas that needed improvements. Using the same example, if facilitators commented on a performance weakness like "the team asked the patient to do a few tests but did not explain clearly what those tests are about", then they should illustrate a suggestion linked with this specific performance, such as "next time, the team can clarify the jargons and make sure the team members and the patient understand the plan" Student 1 in 3.2.3 argued that one particular feedback provided by the facilitator did not help to improve anything because it only told what the team did and did not do. I discovered that the facilitator who gave feedback to Student 1 did not suggest a way to improve the weakness related to the area of Patient-Centred Care; however, the facilitator provided a suggestion for how to improve for another competency that is the Comprehensiveness of the care plan.

The other three facilitators were all doing well to give suggestions on the Delta column. I assumed that all facilitators understood how to use the rubric because they had contributed to the development of the single-point rubric. Interestingly, two out of three facilitators responded in the survey that they did not view the orientation slides that I made, and a facilitator did not respond whether they viewed the slides. Both facilitator-interviewees acknowledged that they did not look at the orientation, but they believed that they knew how to use the rubric.



I think I understood actually probably before that, because one of the things I do like about it is it's, the way it's laid out is quite simple to understand. So, I think ... yeah, I don't think I needed necessarily the orientation ... to use it well, so. (Facilitator 1)

I think I remember having a discussion with the group with the ... yeah. And then ... I think I was clear on how to proceed with the use of the rubric. (Facilitator 2)

Regarding the self-assessment, all students who completed the survey admitted writing feedback by using the rubric could help identify whether their performance met the criteria. Yet, a facilitator determined most students not following the orientation rules to use the single-point rubric for self-assessment. The students wrote similar comments to the described criteria, indicating the comments overlapping with the criteria, but it was not necessary to write feedback on the Delta-Plus columns if a student satisfied the criteria. Nonetheless, the facilitator considered it as a positive thing because this may demonstrate students' commitment to self-examination.

So, even though in the instruction it said, you do not need to write additional comments in the Delta and Plus, I found that almost all of the students actually wrote comments ... So, that was good, because it meant they were thinking rather than just putting in check marks in the box ... So, I do think it did help them write the rubric, write the reflection. (Facilitator 2)

Also, the facilitator observed that some students reflect their performance better by using the single-point rubric, compared to self-reflection writing.

I obviously found there were a couple of assessments were actually better than the written reflection, so the actual rubric had more meat and potatoes in it than the actual written reflection. (Facilitator 2)

This finding was consistent with our examination on the 24 completed self-assessment rubrics. Appendix Q shows an example of student self-assessment results. Students measured themselves by comparing the actual performance to the given criteria. Overall, what they wrote on the Delta-Plus columns was critical and justifiable.

### *3.5 Additional findings*

It was mentioned up front that the surveys and interviews involved questions regarding the understandability and the reasonableness of the described criteria in the rubric for the elective course. Shown in the survey results, all the students (100%) agreed that the rubric criteria were comprehensive and reasonable for the course. In comparison to the results in Chapter 3 that some students in the foundational course disagreed that the rubric criteria were legitimate for the course or the course content covered all the rubric criteria, results in the elective course showed the positivity of the reasonableness of the rubric criteria. I assumed because the group of course developers was small and the class was small-scaled, we worked closely with each other to ensure the congruency of the course content, the class activity, and the assessments.

The facilitators thought that the rubric was simple and easy to use.

I thought it was simple, it was straightforward. I thought it was easy to use because the, you know, you have right in the middle the expectation. Everything that we're looking for. And then you go one way or the other; if there's something that's a plus, what went well, then you know which way to go, you know what the students did well. Straightforward, that's why I liked it. (Facilitator 1)

So, for the care plan, something very simple was perfect, because we knew we had learners from, you know, the different levels of experience in their professions, so we knew we couldn't be really critical on the content. So, I think the care plan rubric was perfect, because it was simple and it allowed us to mark appropriately. (Facilitator 2)

However, a facilitator-interviewee considered that some other facilitators might find it difficult to make judgement if students performed something not related to the description of expected performance.

I think maybe a disadvantage would be – because it's very specific – if the students are coming up with something that's not specified in the criteria, somebody is not familiar or not comfortable might not see it as an advantage or, you know. So because it's very specific, if a student does something that's different from what's expected, some marker might not see it as straightforward to mark. (Facilitator 1)

Additionally, the student-interviewee like the format of the single-point rubric but suggested giving examples for writing feedback on the areas of improvement in the self-assessment.

I really like that format to be honest, maybe for me ... if there was options for what could be improved and options, like what went well was easy for me to kind of ... pick out right away, I was able to be like, okay I did this, this and I did this proper, well. But areas of improvement I harder time thinking of what I could put in that. So maybe some examples of what are some areas for improvement could've been helpful. (Student 1)

Corresponding to students' preference on either receiving verbal or written feedback discussed in Chapter 3-3.5 Additional findings, I did not ask students the relevant questions in the elective course, because students in this course only received narrative feedback provided on the single-point rubric.

#### **4. Summary**

About the 1a IUA, "Facilitators could provide structured and helpful feedback by using the single-point rubric. Students agreed with the feedback and were able to identify their strengths and weaknesses", the collected validity evidence was analogous to the findings in Chapter 3. Both students and facilitators acknowledged the rubric format assisting in shaping structured and helpful feedback. Differing in the results in the foundational course, facilitators avoided writing non-specific feedback like "Good discussion". Importantly, a facilitator advised that offering a direct suggestion on the rubric would be more helpful for competency promotion. Additionally, all students found that the facilitator's feedback precisely reflects their performance, and they were able to clearly realize their strengths and weaknesses because of the rubric structure. The overall validity evidence linked with the 1a IUA indicated that facilitators in the elective course used the single-point rubric to write better feedback compared to the facilitators in the foundational course. It was possible because the facilitators giving feedback was also the course developers who contributed to developing the single-point rubric, so they were familiar with how to use the rubric properly. And, they had more time to construct feedback compared to the facilitators in the foundational course.

Regarding the 1b IUA, “After engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning”, all students identified positive effects of the feedback for establishing a better IP care plan and for future learning, and 85.71% of students agreed that the feedback could motivate them in future learning. However, the student-interviewee (Student 1) criticized that the guidance from a facilitator’s feedback was not apparent, because the facilitator did not give a clear direction for how to improve a specific area of competency. A facilitator-interviewee considered that the feedback would support future IP learning under a similar context, and the feedback might not work well in other contexts. Also, another facilitator believed that the feedback would benefit learning if students engaged with the written feedback, or students had a chance to work on the feedback for a later assessment in the same course. In summary, whether the feedback could help students perceive directions for improvement depended on the level of engagement, the ability of facilitators to give direct suggestions, and the chance of working on the feedback in a similar assessment context.

For the second IUA, – “Facilitators followed the orientation principles to use the single-point rubric, wrote feedback referencing the criteria on the rubric, and captured main aspects of performance within a competency”, all facilitators subjectively determined that they had followed the principles, and they acknowledged the ease of comparing observed performance against the criteria to write feedback. After examining the facilitators’ completed rubrics, I found that all facilitators captured main aspects of performance within a competency, all feedback was written in the right place. Also, they mostly followed the orientation principles, only one of the four facilitators did not provide a specific suggestion for a competency. The student-interviewee (Student 1) mentioned in the paragraph above, who was coincidentally assessed by this facilitator, claimed that the received feedback was not integrated with a direct suggestion to deal with the weakness in the area of Patient-Centred Care. Nonetheless, through reading the facilitator’s feedback, I deemed that Student 1’s facilitator provided a direct suggestion for another competency but was failed to give a suggestion in one particular competency. Fortunately, all other facilitators rendered direct suggestions to students among the competencies.

Interestingly, facilitators did not view the orientation slides before using the single-point rubric because they assumed that they already understood how to use the rubric. To conclude, facilitators mostly followed the principles to use the single-point rubric, they greatly wrote

feedback referencing the described criteria and picked up key pointers within a competency. In terms of the self-assessment, students found that was helpful to examine their performance compared to the criteria. A facilitator discovered that the self-written feedback on the single-point rubric was sometimes more informative than the written reflection. This finding aligned with the examination of the completed self-assessment rubrics.

In additional findings, all students and facilitators found the rubric content understandable and reasonable for the course. Facilitators found the rubric simple to use. Yet, a facilitator identified a disadvantage of the single-point rubric for some other facilitators. That is, if a facilitator observed performance different from or not related to any descriptive criteria, it would be hard for them to assess that performance. Also, the student-interviewee suggested us providing examples to write feedback on the areas of improvement in the self-assessment.

## **Chapter 5 Results**

This chapter contains a summary of the validity evidence linked with the Implications and Scoring inferences shown in Chapters 3 and 4, the validity evidence, the final validity arguments against the proposed IUAs, and the educational impact of using a single-point rubric.

### **1. Summary of the validity evidence**

#### ***1.1 Evidence for the Implications inference***

The IUAs linked with the Implications inference were: (1a) Facilitators could provide structured and helpful feedback by using the single-point rubric. Students agreed with the feedback and were able to identify their strengths and weaknesses. (1b) After engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning.

Facilitators could provide structured and helpful feedback using the single-point rubric: The findings in Chapter 3 and 4 demonstrated the usefulness of applying the single-point rubric to write structured feedback because the rubric format was clearly laid out what went well and what could be improved, presented in both students and facilitators' opinions. Students in the elective course found the feedback written in self-assessment helpful for writing the final reflection. However, it was not clear whether the facilitators' narrative feedback written on the single-point

rubric was helpful for students to improve collaborative competencies. It likely depended on other contextual factors such as assessing experience and training intensity of a facilitator, based on course developers' opinions. Also, the narrative feedback would be more helpful if facilitators provided specific and explicit feedback on the rubric and avoided making comments like "Good ideas". In this way, the facilitators in the elective course did better as they prevented from writing the non-specific feedback, compared against the facilitators in the foundational course. I presumed that because the facilitators in the elective course had more time to assess the care plans and write feedback, and they took part in developing the single-point rubric so they might be familiar with the application of the rubric. Summarizing and interpreting the evidence for this IUA, I judged that the facilitators could provide structured and potentially helpful feedback using the single-point rubric, but the ability to provide helpful feedback could be affected by facilitators' (a) experiences, (b) training intensity like whether a facilitator views the orientation slides before using the rubric, and (c) familiarity with the application of the rubric.

Students agreed with the feedback and were able to identify their strengths and weaknesses: All students in the elective course agreed that the feedback on the rubric accurately reflected the quality of their care plans. Students in both courses reckoned that the separated Delta and Plus columns allowed them to identify the team strengths and weaknesses. However, since the student in the foundational course did not obtain the single-point rubric with narrative feedback, this IUA was largely supported by the student group in the elective course. Nonetheless, both the student survey and interview results in the elective course showed that students acknowledged the narrative feedback and were able to recognize the advantages and disadvantages of the built care plans. Therefore, it is quite evident that students agreed with the feedback written on the rubric and were able to identify their strengths and weaknesses.

After engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning: In terms of the meaningfulness of the narrative feedback for offering directions in future IP learning, most students identified positive influences of the feedback for establishing a better IP care plan and for future IP improvements, and some of them agreed that the feedback could motivate them in future learning. However, a student in the elective course judged the facilitator evaluating what they had and had not achieved accurately; but without a direct suggestion for how to improve the disadvantageous performance, the meaningfulness of

the feedback to guide future IP learning was minimized. After reviewing the completed rubrics with narrative feedback, I subjectively deemed that most of the feedback written from facilitators in the elective course provided directions for improvement, while facilitators in the foundational course offered less direct suggestions. However, due to the small sample size and students in the foundational course not receiving the narrative feedback, the validity evidence did not sufficiently support this IUA. Further studies with more evidence are needed.

One of the principles of using the single-point rubric was to provide direct suggestions associated with the weaknesses, so that students knew how to improve. Perhaps, because some facilitators in both courses did not view the orientation before using the single-point rubric, they were not able to provide students with clear suggestions. Additionally, a facilitator in the foundational course claimed that the feedback might be helpful but unlikely able to guide future IP learning because they had less time to write everything and only made shorthand notes. While a facilitator in the elective course believed that the feedback would support learning under a similar context or if students had an opportunity to use the feedback in an up-coming assessment in IPE, or when students had more experience in IP collaboration. Also, facilitators believed that students' engagement with the narrative feedback mattered how much the feedback would benefit future learning, which matched part of this proposed IUA. Furthermore, course developers in the foundational course determined whether the feedback on the rubric could support learning did not solely depend on the rubric itself, it was more related to facilitators' ability in giving feedback. I assumed that students could perceive directions for improvement in future IP learning if they engaged with the narrative feedback, and facilitators gave direct suggestions following the principle of using the single-point rubric. I considered other factors, such as (a) the duration of time for facilitators to provide feedback, (b) whether students could use the feedback in a similar context, (c) students' engagement with the narrative feedback, and (d) facilitators' capacity in providing feedback would affect the students to identify directions for improvement from the written feedback.

### ***1.2 Evidence for the Scoring inference***

The IUA linked with the Scoring inference was that facilitators followed the orientation principles to use the single-point rubric, wrote feedback referencing the criteria on the rubric, and captured main aspects of performance within a competency. Regarding whether facilitators

followed the orientation principles, the most critical principle that facilitators in both courses did not follow was the provision of suggestions for improvement. Evidence for the Implication reference shows that if facilitators informed students how to actually enhance a competency instead of telling them what did not do well, it would likely help students identify the directions for future IP learning. The possible reasons of why facilitators did not follow this particular principle were: facilitators were inexperienced to give suggestions in the context of IPE; some facilitators did not look at the orientation slides before using the single-point rubric; and, maybe facilitators in the foundational course were not aware of providing the suggestions because the narrative feedback was not delivered to the students.

As for whether the facilitators could write feedback referencing the criteria on the rubric, the findings in both Chapters 3 and 4 supported that facilitators provide feedback compared against the descriptive criteria. Yet, a few facilitators' feedback overlapped with the descriptive criteria, while if a team met the criteria, it was not essential to write feedback on the Delta-Plus columns. In terms of whether the facilitators could capture key aspects of performance within a competency, I did not find any significant misplaced feedback. Overall written feedback matched the content of each competency. Regarding the self-assessment, students critically measured themselves by comparing the actual performance to the given criteria. Some students even analyzed themselves by using the rubric more informatively than in self-reflection writing. In summary, participants could provide feedback by referencing the descriptive criteria on the rubric and capture main aspects within a competency. But some facilitators did not follow the orientation principles to give suggestions related to the performance weaknesses. The possible reason was that facilitators did not view the orientation, were not familiar with or experienced in providing narrative feedback in the IPE context, or did not have enough time to think of the suggestions and write that down.

### ***1.3. Additional findings***

All participants in the elective course admitted the understandability and reasonableness of the descriptive criteria in the single-point rubric. However, some students in the foundational course did not concur the overall criteria were understandable and reasonable for the course content. There was an assumption that the online module in the foundational course was not plentiful to guide students to attain the rubric criteria (i.e. intended learning outcomes) during assessments. Furthermore, a facilitator identified that some facilitators may be uncomfortable to



provide written feedback on the single-point rubric with limited descriptive criteria. In this regard, the intent to create a single-point rubric with only the expected criteria was to break the boundaries on student performance, and both students and facilitators only had to focus on the expected criteria other than the varying levels of criteria. Perhaps, a rubric with limited descriptive criteria was not easy to use for those who like to read different levels of criteria to make judgements.

A facilitator believed that the single-point rubric suited a smaller course than the large-scale foundational course, and we had examined its use in the small-scale elective course. However, as the students in the elective course received the written feedback but the students in the foundational course did not, it was hard to appraise if the single-point rubric worked better to support learning in a smaller class. In addition, the preference of receiving the rubric with narrative feedback after the assessments varied among students in the foundational course, because solely verbal feedback was enough for some students, while most of the students preferred both verbal and narrative feedback. Of note, students in the elective course only receive narrative feedback, so I did not test the preference for verbal and/or written feedback in the elective course.

## **2. An evaluation of the validity evidence and the formulation of final validity arguments**

After collecting, synthesizing, and analyzing the validity evidence, I compared the findings with the proposed IUAs. This section will let you know whether the IUAs were supported, rejected, where gaps exist, or what corrections to the assessment procedure might be essential. I would like to describe the final validity arguments corresponding to each IUA first, and the paragraphs below will present to you how I came across the IUAs and results to the final validity arguments. The pre-defined IUAs were: For the Implications inference: (1a) Facilitators could provide structured and helpful feedback by using the single-point rubric. Students agreed with the feedback and were able to identify their strengths and weaknesses. (1b) After engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning. For the Scoring inference: (2) Facilitators followed the orientation principles to use the single-point rubric, wrote feedback referencing the criteria on the rubric, and captured key aspects of performance.

The final validity arguments were: (1a) Facilitators could provide structured and *potentially* helpful feedback by using the single-point rubric. Students agreed with the feedback and were able to identify their strengths and weaknesses. (1b) After engaging with the narrative feedback *with*

*clear suggestions*, students could perceive directions for improvement in future IP learning *in a similar context*. (2) Facilitators wrote feedback referencing the criteria on the rubric and captured main aspects of performance within a competency. Facilitators followed *most of* the orientation principles, *but they would need advanced training or reminders to offer direct suggestions to students*.

The 1a IUA: Facilitators could provide structured and helpful feedback by using the single-point rubric. Students agreed with the feedback and were able to identify their strengths and weaknesses: Evaluating the collected validity evidence, there was strong evidence that the rubric construction contributed to formulating structured feedback and identifying the performance strengths and weaknesses efficiently. I modified “helpful feedback” in the IUA to “potentially helpful feedback” in the final validity argument because whether facilitators could write helpful feedback was not rely upon the rubric construction. Some other external factors might influence the helpfulness of narrative feedback, such as facilitators’ experience, training intensity, and familiarity with the application of the rubric. For example, facilitators in the elective course wrote more specific feedback and suggestions because they participated in developing the rubric and were acquainted with the rubric construction, so they wrote better feedback to support student learning compared to the facilitators in the foundational course. It was difficult to test how students thought of the helpfulness of the feedback in the foundational course because they did not get the feedback. To conclude, with all the validity evidence related to this IUA, I identified a gap existing to support that facilitators could provide helpful feedback by using the single-point rubric, so I formulated the final validity argument associated with the 1a IUA as “Facilitators could provide structured and *potentially* helpful feedback by using the single-point rubric. Students agreed with the feedback and were able to identify their strengths and weaknesses”

The 1b IUA: After engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future IP learning: The pilot studies in both the foundational and elective courses showed whether the feedback supports future learning depending on students’ engagement with the feedback, which was already part of the IUA. To support IP learning, the provision of direct suggestions related to team weaknesses could possibly drive the promotion of IP competencies. Furthermore, facilitators were concerned that the narrative feedback would be more supportive of learning in a similar IP context or assessment. For instance,

students may feel challenged to use the feedback received in the care plan assessment within the context of head and neck oncology in another clinical context. Thus, I consider and integrate this factor into the final validity argument. To conclude, summarizing and analyzing the validity evidence related to this IUA, I recognized that there was weak evidence to support this IUA, because the students did not have a chance to reflect on the feedback from an assessment, and then use the feedback on the next assessment. I framed this IUA before running the pilot studies, the original plan of the elective course was to have a discipline presentation, a simulation-based CBA, and the care plan assessment. Students would have received a single-point rubric with feedback in each of those assessments, so I assumed that students could apply the feedback and suggestions from an assessment to another assessment, and I could have examined whether they would have engaged with and used the feedback. Therefore, I found insufficient validity evidence to support the 1b IUA; nonetheless, all students in the elective course responded in the survey that the feedback could help promote future learning. So, there was partial evidence to support this IUA, and I am not going to reject it. I formulated the final validity argument as “After engaging with the narrative feedback *with clear suggestions*, students could perceive directions for improvement in future IP learning *under a similar context*”

The second IUA: Facilitators followed the orientation principles to use the single-point rubric, wrote feedback referencing the criteria on the rubric, and captured key aspects of performance within a competency: There was an issue that some facilitators did not follow the rule to write suggestions related to areas for improvement. Perhaps, facilitators did not view the orientation before using the rubric or were not experienced to provide suggestions, so advanced training or reminders for facilitators to render suggestions to students would be essential. Besides this issue, there was strong evidence to support that many facilitators were doing well to give feedback referencing the criteria on the rubric and capture key aspects of performance. Concerning the second IUA tied with the Scoring inference, the final validity argument was “Facilitators wrote feedback referencing the criteria on the rubric and captured main aspects of performance within a competency. Facilitators followed *most of* the orientation principles, *but they would need advanced training or reminders to offer direct suggestions to students*”

### **3. The exploration of the educational impact**

To explore the educational impact of the single-point rubric, the validity evidence for the Implications inference had the main contribution. Based on the validity evidence, the single-point rubric could help construct structured and potentially helpful feedback, and students could use the feedback to plan actions for future IP learning if they consciously engaged with the feedback. However, though students could effectively recognize the strengths and weaknesses of team performance on the rubric, if direct suggestions were absent, the feedback might be insufficient for planning actions for future learning. Thus, to promote the educational impact of using a single-point rubric on student learning, the provision of direct suggestions regarding areas for improvement might be one of the most important factors.

Moreover, according to the data evaluation, the educational impact was affected by several other factors, Figure 3 displays a scheme of the factors affecting the educational impact of using the single-point rubric to support IP learning. All the factors were extracted and appraised from the collected validity evidence. The factors include the alignment between assessment and course content, facilitators' involvement with the orientation or training to give feedback, the duration of time to write feedback, students' engagement with feedback, and the quality of student self-evaluation and reflection on the received feedback, etc.

## **Chapter 6 Discussion and Conclusion**

The research question of the thesis was: To what degree does the single-point rubric support student learning and facilitators to construct helpful feedback within the context of IPE? The Implications evidence showed that the format of the single-point rubric could help provide structured and potentially helpful feedback. With clear suggestions provided, students could benefit from the feedback and identify directions for improvement in a similar context. The scoring evidence showed that facilitators could refer to the rubric criteria and capture the main aspects of performance within a competence to write feedback, but they might need more training to learn how to provide clear suggestions to students.

## 1. Discussion

Assessment is a part of the integrated teaching-learning-assessment system within the concept of constructive alignment. It is designed to attain meaningful teaching and learning along with appropriate class activities and intended learning outcomes (Briggs et al., 2011). However, whether general IP curricula using suitable assessment is questioned. Collaborative competencies related to IP knowledge, skills, and behaviours are often claimed as the intended learning outcomes in IPE, but many curricula apply self-report attitudinal or perceptual questionnaire to pursue the effectiveness of the course and final IP learning outcomes, while actual collaborative competencies are often not evaluate in the assessment (Riskiyana et al., 2018). Therefore, literature reviews recommend determining collaborative competencies by using direct observation on student performance in order to assess authentic competencies and accomplish experiential learning (Curran et al., 2011; Riskiyana et al., 2018; Spaulding et al., 2019; Thistlethwaite et al., 2015).

In this research, two assessments in the foundational course were CBAs, two assessments in the elective course were a care plan assignment and a self-assessment. So, I have tested the use of the single-point rubric in three assessments through objective observation to assure that the information on the rubric could reflect potentially authentic learning outcomes. Furthermore, to guarantee constructive alignment, course developers and I discussed the content in the single-point rubric to ensure its consistency with the intended learning outcomes and assessment procedures, although some students in the foundational course disagreed the course content covering all the rubric criteria. Besides, two committee members are specialized in measurement who suggested and guided me in the thesis, so that the process of rubric development and validation is measurement-based and dependable. This assessment method and research procedure can inform future studies to apply the single-point rubric under similar IP assessment implementation.

### *1.1 The use of the single-point rubric to support IP learning and teaching*

According to the final validity arguments, the single-point rubric can help facilitators formulate structured judgements and students recognize performance strengths and weaknesses. Also, it has the potential to support further IP learning, if facilitators provide explicit suggestions for improvement, and students engage with the feedback. A single-point rubric covers a couple of intended learning outcomes required in an assessment in one document, and it is flexible to write

feedback on the rubric without sacrificing clarity. Also, instructors, peers, and oneself can use this rubric to write feedback for guiding both learning and teaching. In this thesis, I had developed rubrics for use by both facilitators and students. It showed that students criticized their performance better on the rubric than on the reflection. I assumed that was because the criteria on the rubric were precise and transparent so that students could appraise their performance more effectively. In addition, a single-point rubric is used to form formative feedback. Formative assessment is a process to evaluate student performance and provide feedback to support learning. This assessment approach can assemble detail evidence of student present learning for course developers to adjust instructional strategies. For example, if facilitators observed many teams not performing well in the area of Team Roles, they can evaluate that and modify the teaching method and material to assist students in attaining this intended learning area in the following IP assessment.

However, barriers of using the single-point rubric in IP assessment occurred in this research. Some facilitators may find it hard or inexperienced to write open-ended feedback after observing team performance. The training for writing feedback on the rubric may need adjustment in order to ensure the facilitator's credibility of giving feedback. And, some students in the foundational course preferred verbal feedback instead of the narratives. We believed that providing both verbal and written feedback in IP assessments are beneficial. Opening a dialogue to discuss team performance would be timely for students to identify their competencies and increase their engagement with facilitators' feedback. However, some students recognized the narrative feedback constructed in a better way compared to free-flowing verbal feedback. Thus, to gain a structured comment, written feedback is more advantageous. To conclude, I believe that the provision of both verbal and narrative feedback could be beneficial in IP assessment.

### ***1.2 The implications of using the single-point rubric in IPE***

In IPE, many established assessment tools were out there. However, few pre-qualification IPE studies have focused on investigating the effectiveness and meaningfulness of formative feedback, though it is especially important to IP learning and the delivery of high-quality care outcomes (Hadley et al., 2018). This thesis may prompt IP course developers and educators to reconsider the importance of feedback, and how to give useful feedback. In this thesis, I focused on integrating validity evidence and exploring the educational impact of providing narrative feedback on the single-point rubric. Although both verbal and narrative feedback could be

beneficial and meaningful for students, I investigated the usefulness of narrative feedback that could be delivered in a structured way. And, narrative feedback allows students to save and look over the feedback over the long IP learning journey, which is an admirable advantage of narrative feedback (Brookhart, 2017). For example, students can store the written feedback as learning evidence in a folder or a portfolio, for further considering IP learning goals and tracking their growths. I believed that formative, narrative feedback is new to research regarding IP assessments but valuable to IPE.

### ***1.3 The potential of using the single-point rubric in both formative and summative assessments***

As mentioned in Chapter 2, educational experts want to promote formative assessment other than summative assessment, because the focus of formative assessment is on accelerating student learning, and such assessment has a more positive influence on shaping and motivating self-regulation in learning (Aboulsoud, 2011; Carrillo-de-la-Peña et al., 2009; Nicol & Macfarlane-Dick, 2006). I agreed to focus more heavily on formative assessment to enable deep learning. However, summative assessment has its own role in education, as it aligns with accountability measure in institutes, and summative and formative assessment together benefit via analyzing them side by side to ensure the consistency of both quantitative and qualitative data. IP educators may find valuable to seek an approach in which both summative and formative assessment can be a source of learning (Sambell et al., 2012). Notably, a single-point rubric can be utilized for an assessment balancing both formative and summative elements (see the example in Appendix B & J), because it enables the provision of written feedback and grading.

## **2. Limitations**

The thesis is the first research to apply the single-point rubric in the IPE context. The research procedure and development of single-point rubric could inform future studies to refer to the methods and the use of the single-point rubric in other IP assessments. However, there are several limitations in this thesis. The sample size is small since there were challenges to recruit students. For instance, the timing of sending out the survey links in the foundational course was three weeks after the final assessment, which was close to the end of the term and might lead to low response rate. Unfortunately, the COVID-19 pandemic issue affected the established plan of

the elective course, the shift of the face-to-face assessment to online assessment and the change of other courses might cause stress to students, so they might not have been able to participate in this research. Besides, the single-point rubric and orientation was primarily developed by me, but the final decision and the use of all the materials lied with the course developers and facilitators. Although it benefited on the constructive alignment of the instrument with the course content, some aspects of implementation I recommended might not be adopted. For example, I suggest returning the copy of the single-point rubric to the students in the foundational course, but the group of course developers did not take that, which resulted in insufficient evidence regarding how the students in the foundational course would identify and use the feedback. Additionally, the orientation in the foundational course might be not enough to guide IP facilitators to write suggestions for improvement. I will suggest the future IP course developers to hold an in-person training for facilitators, which could better explain the proper use of the single-point rubric. Moreover, few studies have used Kane's validity framework to guide validation under the IPE context because the concepts of the potential evidence supporting inferences are still hypothetical. Nonetheless, this research used Kane's validity framework to guide the whole process of validation, which gives an idea to future studies using Kane's framework to validate instruments within the IPE context.

### **3. Future directions**

I will reflect on the recruitment method and collect more data in a future study for further validating the interpretation and use of the single-point rubric in IP assessments. Additionally, some facilitators in this study did not follow the principles of writing direct suggestions on the rubric, the training method and procedures may need adjustment, and an in-person training might be needed. Moreover, I hope to promote the use of the single-point rubric to offer formative feedback in IPE, because it has the potential to support learning and teaching.

### **4. Conclusion**

The validity evidence shows that the single-point rubric is advantageous in assisting facilitators to formulate structured and potentially helpful feedback and helping students recognize their performance strengths and weaknesses explicitly. When direct suggestions are provided, and students are motivated to engage with the feedback, the information on the single-point rubric has



the potential to guide improvement in future IP learning. However, more trainings might be essential for the facilitators to learn how to provide suggestions for improvement. In addition, the application of single-point rubric can be used for both summative and formative purposes. Although the educational impact of the single-point rubric is positive, studies with a larger sample size and better recruitment approach are needed to support the hypotheses of using the single-point rubric in IP assessments.

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**Appendix A**  
**Definitions of competencies in the CIHC's national framework**

<b>Competency</b>	<b>Definition</b>
Interprofessional Communication	Learners from varying professions communicate with each other in a collaborative, responsive and responsible manner.
Team functioning	Learners understand the principles of team dynamics and group processes to enable effective interprofessional team collaboration.
Role Clarification	Learners understand their own role and the roles of other professionals and use this knowledge appropriately to establish and meet patient/client/family and community goals.
Interprofessional Conflict Resolution	Learners actively engage self and others, including the client/patient/family, in positively and constructively addressing interprofessional conflict as it arises.
Collaborative Leadership	Learners understand and can apply leadership principles that support a collaborative practice model.
Patient/Client/Family/Community-Centred Care	Learners seek out, integrate and value, as a partner, the input and the engagement of Patient/Client/Family/Community in designing and implementing care/services.

## Appendix B

The single-point rubric used for the scenario-based assessment in the foundational course

Facilitator  
name:

Team  
number:

Round  
(1, 2, 3):

DELTA $\Delta$ What could be improved	Criteria Demonstration of competency	PLUS $+$ What went well
	<p><b>Interprofessional Communication:</b></p> <ul style="list-style-type: none"> <li>• Speak clearly/audibly.</li> <li>• Use positive tone of voice/body language.</li> <li>• Clarify jargon or ideas not understood by all.</li> <li>• Balance active listening &amp; contributing ideas.</li> </ul>	
	<p><b>Team Functioning:</b></p> <ul style="list-style-type: none"> <li>• Seek everyone's opinion/perspectives.</li> <li>• Respond respectfully, without judgement.</li> <li>• Integrate everyone's ideas in decision-making.</li> <li>• Complete required tasks within time period.</li> </ul>	
	<p><b>Team Meeting Roles:</b></p> <ul style="list-style-type: none"> <li>• <b>Initiator:</b> Lead meeting, negotiate agenda, keep team on task, ensure all members contribute.</li> <li>• <b>Timekeeper:</b> Give periodic time reminders, help team finish on time.</li> <li>• <b>Recorder:</b> Make notes of decisions; give verbal summary before end of meeting.</li> <li>• <b>Observer:</b> Sit out, observe team function; at end give feedback as per activity guide.</li> <li>• <b>General Participants:</b> Actively participate, speak up for patient/client or unheard perspectives.</li> </ul>	

	<p><b>Interprofessional Conflict Resolution:</b></p> <ul style="list-style-type: none"><li>• If a disagreement occurs, openly acknowledge.</li><li>• Clarify differences, find commonalities.</li><li>• Decide on a solution to move forward.</li></ul>	
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**Overall feedback for the team considering their performance as a whole:**

Strengths:

Areas for improvement:

**Note to Facilitator: please fill in the score below after you have moved away from the student team.**

We are not grading student teams on this activity; the global rating in this section provides another perspective on team performance. Information in this section will also help inform the assessment of this simulation.

**Considering the team performance across the four competences, please rate from 1 to 5:**

1 = Poor      |      2 = Unsatisfactory      |      3 = Slightly satisfactory      |      4 = Expected      |      5 = Excellent

↑

**Global rating:** \_\_\_\_\_/5 (Decimal scoring can be used, e.g., 0.25 or 0.5)

## Appendix C

**The single-point rubric used for the simulation-based assessment in the foundational course**

Facilitator  
name:

Team  
number:

Round  
(1, 2, 3):

<b>DELTA Δ</b> What could be improved	<b>Criteria</b> Demonstration of competency	<b>PLUS +</b> What went well
	<p><b>Interprofessional Communication:</b></p> <ul style="list-style-type: none"> <li>• Speak clearly/audibly.</li> <li>• Use positive tone of voice/body language.</li> <li>• Clarify jargon or ideas not understood by all.</li> <li>• Balance active listening &amp; contributing ideas.</li> </ul>	
	<p><b>Team Functioning (before and after simulation):</b></p> <ul style="list-style-type: none"> <li>• Seek everyone's opinion/perspectives.</li> <li>• Respond respectfully, without judgement.</li> <li>• Integrate everyone's ideas in decision-making.</li> <li>• Complete required tasks within time period.</li> </ul>	
	<p><b>Team Roles (during simulation):</b></p> <p>Participants (interacting with patient):</p> <ul style="list-style-type: none"> <li>• Demonstrate inclusivity, mutual respect, and trust.</li> <li>• Draw on professional knowledge and skills of team members to improve patient care.</li> </ul> <p>Active Observers:</p> <ul style="list-style-type: none"> <li>• Give constructive feedback (using the Active Observer Role document) to team members.</li> </ul>	



	<p><b>Interprofessional Conflict Resolution:</b></p> <ul style="list-style-type: none"> <li>• If a disagreement occurs, openly acknowledge.</li> <li>• Clarify differences, find commonalities.</li> <li>• Decide on a solution to move forward.</li> </ul>	
	<p><b>Patient-Centred Care:</b></p> <ul style="list-style-type: none"> <li>• Prioritize the patient's main concerns and engage them in decision-making.</li> <li>• Draw on the patient's knowledge of their health and life situation to improve care.</li> <li>• Ensure the patient understands and is agreeable to the proposed treatment plan.</li> </ul>	

**Overall feedback for the team considering their performance as a whole:**

Strengths:

Areas for improvement:

**Note to Facilitator: please fill in the score below after you have moved away from the student team.**

We are not grading student teams on this activity; the global rating in this section provides another perspective on team performance. Information in this section will also help inform the assessment of this simulation.

**Considering the team performance across the four competences, please rate from 1 to 5:**

1 = Poor

2 = Unsatisfactory

3 = Slightly  
satisfactory

4 = Expected

5 = Excellent

↑

**Global rating:** \_\_\_\_\_/5 (Decimal scoring can be used, e.g., 0.25 or 0.5)

## Appendix D

### Student survey questions (for the foundational course)

#### Welcome to the Feedback Form Survey!

This survey is designed to explore students' thoughts about the rubric used in the INT D 403 team activity and the use of the feedback on the rubric. The information will be used to understand the impact of the feedback for motivating students' future interprofessional learning and inform the improvements of the rubric content.

It is encouraged to complete the survey in one sitting, which typically takes about **5 minutes**. Please note, you are **not** required to answer all the questions and may skip questions at any time during the survey.

Your participation is completely voluntary and confidential. No personally identifiable information will be associated with your responses. If you have any questions about the survey, please contact Iris Chao by e-mail at [chengin@ualberta.ca](mailto:chengin@ualberta.ca).

Please read the information letter in [shorturl.at/uBU25](http://shorturl.at/uBU25) for more detail. Thank you for your help.

#### **(A display of the rubrics would be shown before students jumped to the questions)**

Based on the rubric shown above, please select one of the response options for each question below:

\*(IP = Interprofessional)

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not sure
1. I understand the criteria of IP communication.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The criteria of IP Communication are reasonable for the course.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I understand the criteria of Team Functioning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The criteria of Team Functioning are reasonable for the course.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I understand the criteria of Team Roles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The criteria of Team Roles are reasonable for the course.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I understand the criteria of Interprofessional Conflict Resolution.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. The criteria of Interprofessional Conflict Resolution in the rubric for the course.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I understand the criteria of Patient-Centred Care.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. The criteria of Patient-Centred Care are reasonable for the course.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I understand what an expected team performance looks like based on the criteria.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The course content covers all the IP competencies presented in the rubric.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Did you view the rubric in eClass before the IP team activities?**

Yes

No

(If yes, the survey system will show the question below; if no, the question will be skipped.)

**Did having the rubric ahead of time influence how you prepared for the team activities? Please explain your answer.**

**Do you want to receive a copy of the rubric with written feedback for your team?**

Yes

No

(If yes, the survey system will show the question below; if no, the next question will be skipped.)

**What would you do with the feedback on the rubric for your interprofessional learning?**

**Why don't you want to receive a copy of the feedback form with written feedback?**

**Do you have any opinions for the rubric format and how the rubric can be improved?**

**Which profession are you studying?**

Dentistry and Dental Hygiene

Dietetics/Nutrition

Kinesiology

Medical Laboratory Sciences

Medicine

Nursing

Occupational Therapy

Pharmacy

Physical Therapy

Radiation Therapy

Recreation Therapy

Speech-Language Pathology

**Gender**

Male

Female

Others

Prefer not to tell

**Are you willing to participate in a focus group or an interview to share your opinions about the rubric and your experiences?**

Yes! My email address is:

No

## Appendix E

### Facilitator survey questions (for the foundational course)

#### Welcome to the Feedback Rubric Survey!

This survey is designed to explore facilitators' thoughts about the feedback rubric used in the INT D 403 team assessments. The information will be used to understand the reasonableness of the feedback rubric content, the impact of narrative feedback on student learning, and whether the rubric helps facilitators write structured feedback.

It is encouraged to complete the survey in one sitting, which typically takes about **5 minutes**. Please note, you are **not** required to answer all the questions and may skip questions at any time during the survey.

Your participation is entirely voluntary and confidential. No personally identifiable information will be associated with your responses. If you have any questions about the survey, please contact Iris Chao by e-mail at [chengin@ualberta.ca](mailto:chengin@ualberta.ca).

Please read the information letter in [shorturl.at/sELS2](http://shorturl.at/sELS2) for more detail. Thank you for your help.

#### (A display of the rubrics would be shown before students jumped to the questions)

Share your opinions about the rubric.

Please select one of the response options for each question below:

\*(IP = Interprofessional)

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not sure
1. I understood how to use the rubric after the training session.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
2. I understood all the criteria in the rubric.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
3. The rubric was easy to use.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
4. I could identify the expected performance in each competency.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
5. My feedback focused on the team actions.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
6. I gave suggestions for improvement based on team actions.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
7. I wrote feedback based on the four principles.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>

If the student teams were to receive a copy of the rubric with written feedback, would you have changed your feedback? Please explain.

If students received a copy of the rubric with your written feedback, what would you like to see happen with that feedback? Please explain.

Do you have any opinions about the rubric format and how the rubric can be improved?

**Which profession are you studying?**

- |   |  |
|---|--|
| <input type="checkbox"/> Dentistry and Dental Hygiene | <input type="checkbox"/> Occupational Therapy      |
| <input type="checkbox"/> Dietetics/Nutrition          | <input type="checkbox"/> Pharmacy                  |
| <input type="checkbox"/> Kinesiology                  | <input type="checkbox"/> Physical Therapy          |
| <input type="checkbox"/> Medical Laboratory Sciences  | <input type="checkbox"/> Radiation Therapy         |
| <input type="checkbox"/> Medicine                     | <input type="checkbox"/> Recreation Therapy        |
| <input type="checkbox"/> Nursing                      | <input type="checkbox"/> Speech-Language Pathology |

**How many times have you been a facilitator in the IP team assessments?**

- 1-2 times  
 3-4 times  
 More than 4 times

**Gender**

- |                                 |   |
|---------------------------------|---|
| <input type="checkbox"/> Male   | <input type="checkbox"/> Others             |
| <input type="checkbox"/> Female | <input type="checkbox"/> Prefer not to tell |

**Are you willing to participate in a focus group or an interview to share your opinions about the rubric and your experiences?**

- Yes! My email address is:  
 \_\_\_\_\_  
 No

## Appendix F

### Student focus group/interview procedures and questions (for the foundational course)

#### Procedure:

1. Welcome greetings and name tags (3 mins): welcome and thank all the participants for attending the focus group. The facilitator will ask participants to write their names or nicknames on a card and put the card in front of themselves.
2. Introduction (2 mins): point out the purpose of the focus group - this focus group aims to hear students' thoughts about the rubric format and content. Inform the participants that the entire discussion will be audio-recorded, and if they have any questions about the research and the focus group, they can ask at this time.
3. Providing the consent form (5 mins): each participant will receive the information letter and the consent form. They are asked to read the documents and sign on the consent before the focus group. The facilitator will emphasize that every participant should respect others' confidentiality and admit that we cannot guarantee absolute confidentiality. Every participant needs to sign a confidentiality agreement.
4. Focus group discussion/ interview (60 mins/ 15 mins): provide the copies of the rubrics to the participants and discuss the questions below. Inform the participants that they are free to ask questions relating to the topic being discussed at any time during the discussion, and if they do not want to share opinions on some of the questions, just let the facilitator know, and they can take a break.
5. At the end of the focus group, ask participants if they have any further questions about the research, and thank all the participants.

#### Questions in the focus group:

1. What did you think about the interprofessional (IP) team activities, did you achieve what you expected, or which part is difficult for you?
2. (Read through the criteria of Interprofessional Communication together) Are the criteria of Interprofessional Communication reasonable for the course and understandable?
3. (Read through the criteria of Team Functioning together) Are the criteria of Team Functioning reasonable for the course and understandable?
4. (Read through the criteria of Team Roles together) Are the criteria of Team Roles reasonable for the course and understandable?
5. (Read through the criteria of Interprofessional Conflict Resolution together) Are the criteria of Interprofessional Conflict Resolution reasonable for the course and understandable?
6. (Read through the criteria of Patient-Centred Care together) Are the criteria of Patient-Centred Care reasonable for the course and understandable?
7. Did you see the rubric before the team activities in eClass?
8. (For the participants who go yes in #7) Did having the rubric ahead of time affect how you prepared for the team activities?
9. (Provide students a sample of facilitator feedback) Do you think that the feedback is structured and organized?
10. What would you do with the narrative feedback if you received a copy of the rubric?
11. Do you have any opinions about this rubric format and how the rubric can be improved?

## Appendix G

### Facilitator focus group/interview procedures and questions (for the foundational course)

#### Procedure:

1. Welcome greetings and name tags (3 mins): welcome and thank all the participants for attending the focus group. The facilitator will ask participants to write their names or nicknames on a card and put the card in front of themselves.
2. Introduction (2 mins): point out the purpose of the focus group - this focus group aims to hear facilitators' thoughts about the rubric format, content, and the use. Inform the participants that the entire discussion will be audio-recorded, and if they have any questions about the research and the focus group, they can ask at this time.
3. Providing the consent form (5 mins): each participant will receive the information letter and the consent form. They are asked to read the documents and sign on the consent before the focus group. The facilitator will emphasize that every participant should respect others' confidentiality and admit that we cannot guarantee absolute confidentiality. All the participants will be required to sign a confidentiality agreement.
4. Focus group discussion/ interview (60 mins/ 15 mins): provide the copies of the rubrics. Inform the participants that they are free to ask questions relating to the topic being discussed at any time during the discussion, and if the participants do not want to share opinions on some of the questions, just let the facilitator know, and they can take a break.
5. At the end of the focus group, ask participants if they have any further questions about the research, and thank all the participants.

#### Questions in the focus group/ interview:

1. Did you understand how to use the rubric after the training session? (to identify the expected performance and structurally write feedback based on the four principles)
2. Did you understand all the criteria in the rubric?
3. Did you have any difficulties while using the rubric?
4. Were the criteria reasonable for the students in the introductory course?
5. How did you suggest a team to improve IP competencies on the rubric? Give an example.
6. Do you think that your feedback on the rubric could help students prepare for the following team activity if they received a copy of the rubric?
7. Do you think that your feedback on the rubric could give students a clear direction to plan for improvements if they received a copy of the rubric?
8. Do you think that your feedback on the rubric can motivate students in future IP learning? If yes, how? If no, why?
9. Do you have any opinions about this rubric format and how the rubric can be improved?

## Appendix H

### Course developer focus group/interview procedures and questions (for the foundational course)

#### Procedure:

1. Welcome greetings and name tags (3 mins): welcome and thank all the participants for attending the focus group. The facilitator will ask participants to write their names or nicknames on a card and put the card in front of themselves.
2. Introduction (2 mins): point out the purpose of the focus group - this focus group aims to hear course developers' thoughts about the rubric format and content. Inform the participants that the entire discussion will be audio-recorded, and if they have any questions about the research and the focus group, they can ask at this time.
3. Providing the consent form (5 mins): each participant will receive the information letter and the consent form. They are asked to read the documents and sign on the consent before the focus group. The facilitator will emphasize that every participant should respect others' confidentiality and admit that we cannot guarantee absolute confidentiality. All the participants are required to sign a confidentiality agreement.
4. Focus group discussion/ interview (40 mins/ 10 mins): provide the copies of the rubrics. Inform the participants that they are free to ask questions relating to the topic being discussed at any time during the discussion, and if the participants do not want to share opinions on some of the questions, just let the facilitator know, and they can take a break.
5. At the end of the focus group, ask participants if they have any further questions about the research, and thank all the participants.

#### Questions in the focus group:

1. What are your opinions on using this rubric in the interprofessional team activities?
2. Do you think that the feedback on the rubric could guide students to improve IP competencies if they received a copy of the rubric?
3. Do you think that the feedback on the rubric for the first team assessment could help enhance the team performance in the next assessment if students had a copy of rubric?
4. Do you think that the feedback on the rubric could motivate students in future IP learning if they received a copy of the rubric? If yes, how? If no, why?
5. Do you have any opinions about this rubric format and how the rubric can be improved?



## Appendix I

### An example of a completed single-point rubric with structured feedback.

<b>DELTA Δ</b> What could be improved	<b>Criteria</b> Demonstration of competency	<b>PLUS +</b> What went well
Could suggest more communication with the client	<b>Interprofessional Communication:</b> <ul style="list-style-type: none"> <li>• Speak clearly/audibly.</li> <li>• Use positive tone of voice/body language.</li> <li>• Clarify jargon or ideas not understood by all.</li> <li>• Balance active listening &amp; contributing ideas.</li> </ul>	Prominent person tried to adjust approach
The clarity of final decision of the plans was low	<b>Team Functioning:</b> <ul style="list-style-type: none"> <li>• Seek everyone's opinion/perspectives.</li> <li>• Respond respectfully, without judgement.</li> <li>• Integrate everyone's ideas in decision-making.</li> <li>• Complete required tasks within time period.</li> </ul>	- Different personalities but members still seemed comfortable to express our opinions  - Dominant member reframed questions to avoid aggressive approach
Recorder could provide more intermittent summary	<b>Team Meeting Roles:</b> <ul style="list-style-type: none"> <li>• <b>Initiator:</b> Lead meeting, negotiate agenda, keep team on task, ensure all members contribute.</li> <li>• <b>Timekeeper:</b> Give periodic time reminders, help team finish on time.</li> <li>• <b>Recorder:</b> Make notes of decisions; give verbal summary before end of meeting.</li> <li>• <b>Observer:</b> Sit out, observe team function; at end give feedback as per activity guide.</li> <li>• <b>General Participants:</b> Actively participate, speak up for patient/client or unheard perspectives.</li> </ul>	-Initiator is confident to express opinions but ensured to draw contributions of members

	<p><b>Interprofessional Conflict Resolution:</b></p> <ul style="list-style-type: none"> <li>• If a disagreement occurs, openly acknowledge.</li> <li>• Clarify differences, find commonalities.</li> <li>• Decide on a solution to move forward.</li> </ul>	<p>Fairly open discussion of conflicting perspectives</p>
--	---	---

**Overall feedback for the team considering their performance as a whole:**

Strengths:

- Able to manage conflict
- Members able to contribute despite difference in personalities
- Took feedback from earlier scenarios to improve

Areas for improvement:

- More focus on including discussion with clients
- Should improve the clarity with the plans
- Should increase confidence that one's contribution may not be trivial

**Note to Facilitator: please fill in the score below after you have moved away from the student team.**

We are not grading student teams on this activity; the global rating in this section provides another perspective on team performance. Information in this section will also help inform the assessment of this simulation.

**Considering the team performance across the four competences, please rate from 1 to 5:**

1 = Poor

2 = Unsatisfactory

3 = Slightly  
satisfactory

4 = Expected

5 = Excellent

Global rating: 4 /5 (Decimal scoring can be used, e.g., 0.25 or 0.5)

## Appendix J

### The single point rubric used for the care plan assignment in the elective course

**Student name:** \_\_\_\_\_

**Instruction:**

If the student meets all the criteria, you do not need to write feedback on the DELTA and PLUS columns. Your written feedback would help the student to reflect on their work.

Please rate from 1 to 5 for each competency. Decimal scoring can be used in the ratings, e.g., 0.25 or 0.5. A score of 4 indicates the team performance meets all the criteria.

**Rating criteria:**

1 = Does not meet criteria at all; 2 = Slightly meets criteria; 3 = Moderately meets criteria; 4 = Fully meets criteria; 5 = Exceeds expectation - the student does better than the criteria and receives feedback on the PLUS column.

DELTA $\Delta$ What could be improved	Criteria Demonstration of competency	PLUS $+$ What went well	Rating
	<p><b>Patient-Centred Care:</b> The team prioritized the patient's main concerns, integrated the patient's values and priorities, and engaged the patient and family in establishing an interprofessional care plan.</p>		/ 5
	<p><b>SMART goals</b> The goals are specific, measurable, attainable, relevant, and time-based.</p>		/ 5
	<p><b>Comprehensiveness</b> The plan describes reasonable connections between goals, intervention approach, and evaluation of outcomes. Clinical reasoning is evident throughout. The language used is understandable for other disciplines.</p>		/ 5
<b>Global rating:</b>			/15

## Appendix K

### The single point rubric used for students' self-assessment in the elective course

**Instruction:** Please assess yourself for whether your performance in the interaction with other peers in creating the care plans satisfies the criteria below. If you meet all the criteria, you do not need to write additional comments on the DELTA and PLUS columns, and you can put a tick (✓) on the fulfilled criteria. If you find anything could be improved or went well over the criteria, please write them down on the DELTA or PLUS columns.

<b>DELTA Δ</b> What could be improved	<b>Criteria</b> Demonstration of competency	<b>PLUS +</b> What went well
	<p><b>Role Clarification:</b></p> <ul style="list-style-type: none"> <li>● I understood my own and other peers' professional roles. I incorporated other professions' roles when formulating the care plan.</li> <li>● When professional roles overlapped, I listened to other professionals, identified this overlap, and integrated the care plan with equitable distribution of workload.</li> </ul>	
	<p><b>Team Meeting Roles:</b></p> <p>(Only evaluate your role in the team)</p> <ul style="list-style-type: none"> <li>● <b>Initiator:</b> Led meeting, negotiated agenda, kept the team on task, ensured all members contribute.</li> <li>● <b>Timekeeper:</b> Gave periodic time reminders, helped the team finish on time.</li> <li>● <b>Recorder:</b> Made notes of decisions, gave a verbal summary before the end of the meeting.</li> <li>● <b>General Participants:</b> Actively participated, supported collaborative practice, spoke up for patient or unheard perspectives.</li> </ul>	

	<p><b>Interprofessional Communication:</b></p> <ul style="list-style-type: none"> <li>● I spoke clearly and audibly. Language was free of jargon; if jargon was used, the terms were clarified for teammates.</li> <li>● I contributed ideas to others and actively listened to others' ideas.</li> <li>● I stated my role and care goals for the care plans.</li> </ul>	
	<p><b>Interprofessional conflict resolution:</b></p> <ul style="list-style-type: none"> <li>● If conflicts/disagreements occur within the team, I demonstrated respect for my fellow team members and encouraged them to express diverse opinions.</li> <li>● I positively and constructively addressed disagreements and helped the team members reach a consensus on creating a care plan.</li> </ul>	

**Please evaluate your performance and interaction with peers in making the care plans on the following items:**

Contribution of my expertise to team goals	Low	Average	High
Quality of interaction and flexibility in adaptation to the team	Low	Average	High

**Please rate yourself for how well the team would have succeeded if you had NOT been a member:**

| Better | The same | Poorer |

## Appendix L

### Student survey questions (for the elective course)

#### Welcome to the Interprofessional Rubric Survey!

This survey is designed to explore students' thoughts about the self-assessment within the reflection writing and the care plan assignment rubric applied in REHAB 503/RADTH410. The information will be used to inform the improvements in the rubrics.

It is encouraged to complete the survey in one sitting, which typically takes about **5 minutes**. Please note, you are **not** required to answer all the questions and may skip questions at any time during the survey.

Your participation is completely voluntary and confidential. No personally identifiable information will be associated with your responses. If you have any questions about the survey, please contact Iris Chao by e-mail at [chengin@ualberta.ca](mailto:chengin@ualberta.ca).

Thank you for your help.

#### (A copy of the self-assessment rubric would be shown before students jumped to the questions)

After viewing the rubric, please select one of the response options for each question below:

\*(IP = Interprofessional)

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not sure
1. I understood every criterion in this rubric.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I understood how to use this rubric to evaluate myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The criteria of the competencies in this rubric were reasonable for the course.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The rubric was easy to use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I wrote structured feedback for myself by using this rubric.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The feedback was helpful for me to construct the reflection writing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. The feedback on the rubric gives me a direction to plan actions for improvement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. The feedback on the rubric motivates me in future IP learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. How will you improve your IP competencies after reflecting on the feedback from this self-assessment?

14. Do you have any difficulties while using this self-assessment rubric?

**(A copy of the care plan rubric would be shown before students jumped to the questions)**

After viewing the rubric, please select **one** of the response options for each question below:

\*(IP = Interprofessional)

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not sure
1. I understood every criterion in this rubric.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The criteria of the competencies in the rubric were reasonable for the course.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The criteria helped guide my team for completing the assignment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The feedback written on this rubric from the instructor was structured.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. The feedback from the instructor accurately reflected the quality of our care plan assignment.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
6. The feedback was helpful for me to create better IP care plans in the future.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>

7. You have received the rubric with written feedback for the care plan assignment on eClass, what would you do with the feedback?

8. Do you have any opinions for the rubrics' format and how these two rubrics can be improved?

**Which profession are you studying?**

- Occupational Therapy
- Physical Therapy
- Radiation Therapy
- Speech-Language Pathology

**Gender**

- Male
- Female
- Others
- Prefer not to tell

**Are you willing to participate in a telephone interview to share your opinions about the rubric and your interprofessional experiences?**

Yes! My email address OR phone number is:

\_\_\_\_\_

\_\_\_\_\_

No



## Appendix M

### Facilitator survey questions (for the elective course)

This survey is designed to explore instructors' thoughts about the rubric used in the REHAB 503/RADTH 410 care plan assignment. The information will be used to understand the impact of feedback on students' future interprofessional learning and improve rubric content.

It is encouraged to complete the survey in one sitting, which typically takes about **5 minutes**. Please note, you are **not** required to answer all the questions and may skip questions at any time during the survey.

Your participation is entirely voluntary and confidential. No personally identifiable information will be associated with your responses. If you have any questions about the survey, please contact Iris Chao by e-mail at [chengin@ualberta.ca](mailto:chengin@ualberta.ca).

Thank you for your help.

#### **(A copy of the care plan rubric would be shown before students jumped to the questions)**

Did you view the orientation for using the single-point rubric in eClass before using the rubric?

Yes   No

After viewing the rubric, please select **one** of the response options for each question below:

\*(IP = Interprofessional)

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not sure
1. I understood all the criteria in this rubric.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
2. I understood how to use this rubric.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
3. The criteria of the competencies in this rubric were reasonable for the course.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
4. The rubric was easy to use.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
5. I could identify the expectation of each competency for a team.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
6. The rubric helped me construct feedback.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>
7. I gave meaningful feedback to students.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/>

8. Students have received the copy of rubric with your written feedback, what would you like to see happen with the feedback? Please explain.

9. Do you think that the feedback on the rubric was helpful for students in **future IP care plan design**? Explain your reasons.

10. Do you have any opinions about the rubric format and how the rubric can be improved?

**Which discipline are you working in?**

- Occupational Therapy  
 Physical Therapy  
 Radiation Therapy  
 Speech-Language Pathology

**How many times have you been an instructor in interprofessional curricula?**

- 1 – 2 times  
 3 – 4 times  
 more than 4 times

**Gender**

- Male  
 Female  
 Others  
 Prefer not to tell

**Are you willing to participate in a telephone interview to share your opinions about the rubric and your assessing experiences?**

- Yes, I am willing to participate in the telephone interview.  
 → My email address: \_\_\_\_\_  
 Or → My phone number: \_\_\_\_\_  
 No

## Appendix N

### Student focus group/interview procedures and questions (for the elective course)

#### Procedure:

1. Welcome greetings and name tags (3 mins): welcome and thank all the participants for attending the focus group. The facilitator will ask participants to write their names or nicknames on a card and put the card in front of themselves.
2. Introduction (2 mins): point out the purpose of the focus group - this focus group aims to hear students' thoughts about the rubric format and content. Inform the participants that the entire discussion will be audio-recorded, and if they have any questions about the research and the focus group, they can ask at this time.
3. Providing the consent form (5 mins): each participant will receive the information letter and the consent form. They are asked to read the documents and sign on the consent before the focus group. The facilitator will emphasize that every participant should respect others' confidentiality and admit that we cannot guarantee absolute confidentiality. Every participant needs to sign a confidentiality agreement.
4. Focus group discussion/ interview (60 mins/ 15 mins): provide the copies of the rubrics to the participants and discuss the questions below. Inform the participants that they are free to ask questions relating to the topic being discussed at any time during the discussion, and if they do not want to share opinions on some of the questions, just let the facilitator know, and they can take a break.
5. At the end of the focus group, ask participants if they have any further questions about the research, and thank all the participants.

#### Questions in the interview:

1. What do you think about the interprofessional team activities, did you achieve what you expected, or which part is difficult for you?
2. Did the narrative feedback on the rubric explain why you did well and suggest how to improve the specific skills?
3. Did you think that the instructor's feedback was structured and helpful to you?
4. Did the feedback on the rubric accurately reflect your team performance of creating the care plan?
5. Did you think that the instructor's feedback provided a variety of rich narrative feedback to you?
6. Did you think the self-assessment was helpful for you to write the reflection? If yes, how? If no, why?
7. Did you think the format of the rubric benefit you to evaluate yourself?
8. Considering your experience with the team assessments, what did you learn from the feedback, Both from yourself and instructor?
9. Would you use the feedback in future interprofessional learning? If yes, how? If no, why?
10. Was the feedback helpful for you to plan for improvements in interprofessional learning?
11. Do you have any opinions about this rubric format and how the rubric can be improved?

## Appendix O

### Facilitator focus group/interview procedures and questions (for the elective course)

#### Procedure:

1. Welcome greetings and name tags (3 mins): welcome and thank all the participants for attending the focus group. The facilitator will ask participants to write their names or nicknames on a card and put the card in front of themselves.
2. Introduction (2 mins): point out the purpose of the focus group - this focus group aims to hear facilitators' thoughts about the rubric format, content, and the use. Inform the participants that the entire discussion will be audio-recorded, and if they have any questions about the research and the focus group, they can ask at this time.
3. Providing the consent form (5 mins): each participant will receive the information letter and the consent form. They are asked to read the documents and sign on the consent before the focus group. The facilitator will emphasize that every participant should respect others' confidentiality and admit that we cannot guarantee absolute confidentiality. All the participants will be required to sign a confidentiality agreement.
4. Focus group discussion/ interview (60 mins/ 15 mins): provide the copies of the rubrics. Inform the participants that they are free to ask questions relating to the topic being discussed at any time during the discussion, and if the participants do not want to share opinions on some of the questions, just let the facilitator know, and they can take a break.
5. At the end of the focus group, ask participants if they have any further questions about the research, and thank all the participants.

#### Questions in the interview:

1. Did you view the orientation PowerPoint of using the single-point rubric in advance?
2. Did you understand how to use the rubric after the watching the orientation?
3. Did you understand all the criteria in the rubric?
4. Could you identify the expected team performance on the rubric in the assessments?
5. Do you think that your feedback was structured and helpful for students?
6. Did you have any difficulties while using the rubric?
7. Do you think that your feedback on the rubric could give students a clear direction to plan for improvements?
8. Do you think that your feedback on the rubric can motivate students in future IP learning? If yes, how? If no, why?
9. It seems that you have used both the care-plan assignment and self-reflection rubrics. What are the different advantages of both two rubrics?
10. Students used a single point rubric for self-assessment, do you think that is helpful for them to write reflection?
11. Do you have any opinions about this rubric format and how the rubric can be improved?

## Appendix P

### An example of a completed single-point rubric in the care plan assessment.

**Rating criteria:**

1 = Does not meet criteria at all; 2 = Slightly meets criteria; 3 = Moderately meets criteria; 4 = Fully meets criteria; 5 = Exceeds expectation - the student does better than the criteria and receives feedback on the PLUS column.

<b>DELTA Δ</b> What could be improved	<b>Criteria</b> Demonstration of competency	<b>PLUS +</b> What went well	<b>Rating</b>
	<p><b>Patient-Centred Care:</b> The team prioritized the patient's main concerns, integrated the patient's values and priorities, and engaged the patient and family in establishing an interprofessional care plan.</p>	-goals are patient-centered as they address patient concerns	5 / 5
-need time-base for when the short-term goals will be assessed	<p><b>SMART goals</b> The goals are specific, measurable, attainable, relevant, and time-based.</p>		4 / 5
-could have included other professions in the recommendation to manage goal i.e. dietitian -could also have considered OT consultation	<p><b>Comprehensiveness</b> The plan describes reasonable connections between goals, intervention approach, and evaluation of outcomes. Clinical reasoning is evident throughout. The language used is understandable for other disciplines.</p>		5 / 5
<b>Global rating:</b>			<b>14 / 15</b>

## Appendix Q

### An example of a completed single-point rubric in the self-assessment.

**Instruction:** Please assess yourself for whether your performance in the interaction with other peers in creating the care plans satisfies the criteria below. If you meet all the criteria, you do not need to write additional comments on the DELTA and PLUS columns, and you can put a tick (✓) on the fulfilled criteria. If you find anything could be improved or went well over the criteria, please write them down on the DELTA or PLUS columns.

<b>DELTA Δ</b> What could be improved	<b>Criteria</b> Demonstration of competency	<b>PLUS +</b> What went well
<p>It was difficult to incorporate other professions' roles because we did not have a very good understanding of said roles since the presentations that were supposed to happen on the first face-to-face meeting could not happen. This limited collaboration because RT students took care of recording RT goals, and so on.</p>	<p><b>Role Clarification:</b></p> <ul style="list-style-type: none"> <li>● I understood my own and other peers' professional roles. I incorporated other professions' roles when formulating the care plan.</li> <li>● When professional roles overlapped, I listened to other professionals, identified this overlap, and integrated the care plan with equitable distribution of workload.</li> </ul>	<p>I understood my own role well – as the SLP team, we had good communication prior to the online meeting with our peers and we were well-prepared</p>
	<p><b>Team Meeting Roles:</b></p> <p>(Only evaluate your role in the team)</p> <ul style="list-style-type: none"> <li>● <b>Initiator:</b> Led meeting, negotiated agenda, kept the team on task, ensured all members contribute.</li> <li>● <b>Timekeeper:</b> Gave periodic time reminders, helped the team finish on time.</li> <li>● <b>Recorder:</b> Made notes of decisions, gave a verbal summary before the end of the meeting.</li> <li>✓ ● <b>General Participants:</b> Actively participated, supported collaborative practice, spoke up for patient or unheard perspectives.</li> </ul>	<p>As a general participant, I did my best to participate and ask questions because I wanted to learn more about the roles and perspectives of our other team members</p>

<p>Team members including myself did not always use jargon-free language.</p> <p>It was more difficult to navigate discussions since we were not face-to-face.</p>	<p><b>Interprofessional Communication:</b></p> <ul style="list-style-type: none"> <li>● I spoke clearly and audibly. Language was free of jargon; if jargon was used, the terms were clarified for teammates.</li> <li>✓ ● I contributed ideas to others and actively listened to others' ideas.</li> <li>● I stated my role and care goals for the care plans.</li> </ul>	<p>I was an active listener and contributor.</p>
<p>As a team we did not have any moments conflict because</p> <ol style="list-style-type: none"> <li>1) Our time working together was short</li> <li>2) We mostly stayed in our lanes working on goals within our scopes of practice (a lack of collaboration partly due to circumstances)</li> </ol>	<p><b>Interprofessional conflict resolution:</b></p> <ul style="list-style-type: none"> <li>● If conflicts/disagreements occur within the team, I demonstrated respect for my fellow team members and encouraged them to express diverse opinions.</li> <li>● I positively and constructively addressed disagreements and helped the team members reach a consensus on creating a care plan.</li> </ul>	

**Please evaluate your performance and interaction with peers in making the care plans on the following items:**

Contribution of my expertise to team goals	Low	Average	High
Quality of interaction and flexibility in adaptation to the team	Low	Average	High

**Please rate yourself for how well the team would have succeeded if you had NOT been a member:**

| Better | The same | Poorer |

**Table 1. Examples of types of validity evidence to support the four inferences within Kane's validity framework (Cook et al., 2015).**

	<b>Definitions</b>	<b>Quantitative assessments</b>	<b>Qualitative assessments</b>
<b>Scoring</b>	This refers to the process of interpreting an observed performance to an observed score or a judgement. It emphasizes the accuracy of a quantitative rating or insightful qualitative comment transformed from the observation of performance.	<ul style="list-style-type: none"> <li>• Assessor selection and training</li> <li>• Score accuracy and reliability</li> <li>• Item and response option performance (point biserial, response option analyses, item difficulty)</li> <li>• Standardized equating</li> </ul>	<ul style="list-style-type: none"> <li>• Assessor selection and training</li> <li>• Assessor with credibility to offer the requested insights</li> <li>• The accuracy, richness, authenticity, and fairness of qualitative data (e.g. narratives)</li> <li>• Observation conditions enough to inform meaningful narratives</li> </ul>
<b>Generalization</b>	It articulates whether the results of an assessment can represent the results in other similar assessments or clinical events theoretically.	<ul style="list-style-type: none"> <li>• Reliability of items, assessors, tasks etc.</li> <li>• Sampling strategy, random versus purposive sampling</li> <li>• Sample size</li> </ul>	<ul style="list-style-type: none"> <li>• Consistency and reflexivity of interpretations generated by different assessors</li> <li>• Sampling strategy, random versus purposive sampling</li> <li>• Defensibility and transparency of the interpretive process</li> </ul>
<b>Extrapolation</b>	This refers to evidence for how well learners will perform in future learning and fresh clinical contexts and how well assessment results correlate to real-life performance.	<ul style="list-style-type: none"> <li>• Authenticity of scenario (e.g. the use of patients, task alignment) and assessment context (e.g. simulation, clinical setting)</li> <li>• Relationship with another measure results</li> <li>• Construct analysis such as factor analysis</li> </ul>	<ul style="list-style-type: none"> <li>• The relevance of narratives to performance</li> <li>• Relationship between qualitative data with other type of measure such as quantitative data.</li> </ul>
<b>Implications</b>	This refers to the process of interpreting a score or judgement to an individual's decisions. It underlines how the assessment consequence impacts decision making.	<ul style="list-style-type: none"> <li>• Pass/fail standard</li> <li>• Assessment consequences and impact on learners and assessors</li> <li>• Ability to plan actions based on assessment results</li> </ul>	<ul style="list-style-type: none"> <li>• Agreement of stakeholders with final judgement</li> <li>• Assessment consequences and impact on learners and assessors</li> <li>• Ability to plan actions based on assessment results</li> </ul>



**Table 2. Summary of inference categories, their definitions, interpretation/use arguments (IUAs), the sources of collected validity evidence, and associated analyses.**

Inference	Definition	IUAs	Collected validity evidence	Analyses
Implications	<p>This refers to the process of interpreting a score or judgement to an individual's decisions. It emphasizes the consequence and impact of an assessment:</p> <p>(a) In qualitative assessments, this inference is expected to see that both judgement providers (facilitators or assessors) and receivers (students) agree with the content of narratives.</p> <p>(b) And, the narratives can constitute a basis for meaningful decision-making and action planning.</p> <p>(Cook et al., 2015; Kane, 2013)</p>	<p>(a) Facilitators could provide structured and helpful feedback by using the single-point rubric. Students agreed with the feedback and were able to identify their strengths and weaknesses.</p> <p>(b) After engaging with the narrative feedback on the rubric, students could perceive directions for improvement in future interprofessional learning.</p>	<p>(a) With facilitator, course developer survey and interview outcomes and examination on the completed rubrics with narrative feedback, we appraised the quality of the feedback. Students' perspectives on the feedback were identified in the students' survey and interview results.</p> <p>(b) The survey and interview responses from the facilitators, students, and course developers would provide evidence for the usefulness of the narrative feedback for supporting learning.</p>	<p>Descriptive analysis for the survey results and thematic analysis for both the survey and interview results were conducted. Also, the completed rubrics with narrative</p>
Scoring	<p>This refers to the process of interpreting an observed performance to an observed score or a judgement. It emphasizes the accuracy and authenticity of scores and judgements:</p> <p>(a) In qualitative assessments, this inference is expected to see that assessors are credible to make judgements and observe the behaviours they are required to assess.</p> <p>(Cook et al., 2015; Kane, 2013)</p>	<p>(a) Facilitators followed the orientation principles to use the single-point rubric and wrote feedback compared against the criteria on the rubric and captured main aspects of performance within a competency.</p>	<p>Through evaluating facilitators' survey and interview outcomes and reviewing the completed rubrics with narrative feedback, we appraised whether facilitators followed the use principles, whether facilitators captured key performance within a competency, and whether the rubric could prompt rich feedback writings.</p>	<p>feedback were reviewed and the themes related to the IUAs were determined.</p>

**Table 3. Characteristics of participants**

	N of participants	Professions (%)	Gender (%)	Times of being assessors in IPE (%)
<b>Data collection after the foundational course</b>				
Student survey	42	Medicine (19.5) Nursing (19.5) Occupational Therapy (17.1) Physical Therapy (17.1) Speech-Language Pathology (12.2) Pharmacy (7.3) Dietetics/Nutrition (2.4) Medical Laboratory Sciences (2.4) Radiation Therapy (2.4)	Female (60) Male (37.5) Others (2.5)	N/A
Student interview	2	Speech-Language Pathology (50) Nursing (50)	Female (50) Others (50)	N/A
Facilitator survey	14	Nursing (46.2) Medicine (30.8) Recreation Therapy (7.7) Speech-Language Pathology (7.7) Spiritual Care (7.7)	Female (78.6) Male (14.3) Prefer not to tell (7.1)	1-2 (71.4) 3-4 (28.6)
Facilitator interview	3	Medicine (33.3) Nursing (33.3) Recreation Therapy (33.3)	Female (100)	1-2 (66.7) 3-4 (33.3)
Course developer interview	2	HSERC members at the University of Alberta (100)	Female (100)	>4 (100)
<b>Data collection after the elective course</b>				
Student survey	7	Speech-Language Pathology (71.4) Radiation Therapy (28.6)	Female (85.7) Male (14.3)	N/A
Student interview	1	Speech-Language Pathology (100)	Female (100)	N/A
Facilitator survey	3	Radiation Therapy (66.7) Speech-Language Pathology (33.3)	Female (66.7) Male (33.3)	1-2 (33.3) 3-4 (33.3) >4 (33.3)
Facilitator interview	2	Radiation Therapy (100)	Female (100)	1-2 (50) 3-4 (50)

Note: HSERC = Health Science Education and Research Commons.

**Table 4. Descriptive analysis of the survey conducted in the foundational course.**

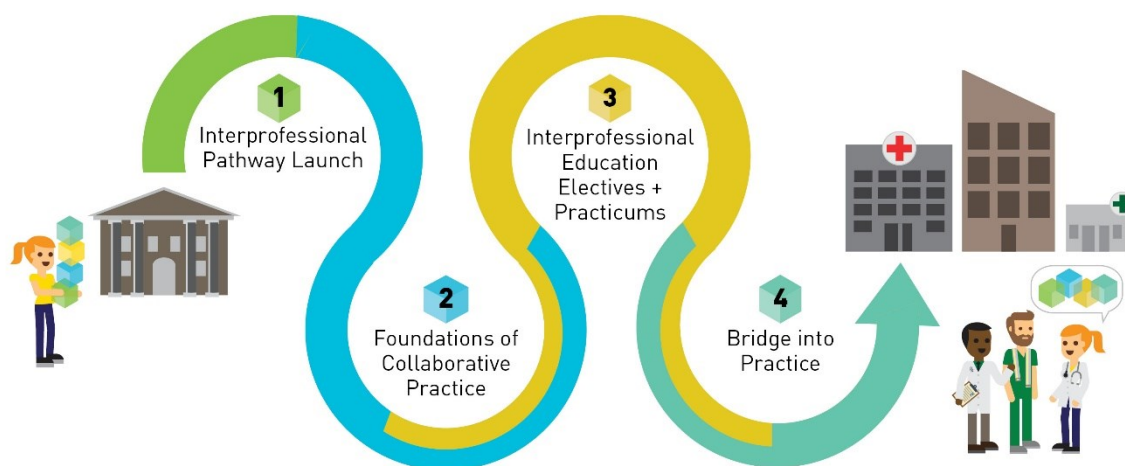
<b>Student survey (n=42)</b>					
Did you view the Facilitator Feedback Form in eClass before the interprofessional team assessments? = Yes (73.8%)					
<b>Items</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Not sure</b>
1. I understand the criteria for Interprofessional Communication.	0 (0)	1 (2.38%)	16 (38.1%)	25 (59.52%)	0 (0)
2. The criteria of Interprofessional Communication are reasonable for the course.	0 (0)	1 (2.38%)	17 (40.48%)	23 (54.76%)	1 (2.38%)
3. I understand the criteria for Team Functioning.	0 (0)	1 (2.38%)	12 (28.57%)	29 (69.05%)	0 (0)
4. The criteria of Team Functioning are reasonable for the course.	0 (0)	8 (19.05%)	14 (33.33%)	19 (45.24%)	1 (2.38%)
5. I understand the criteria for Team Roles.	0 (0)	0 (0)	16 (38.1%)	26 (61.9%)	0 (0)
6. The criteria of Team Roles are reasonable for the course.	0 (0)	8 (19.05%)	15 (35.71%)	18 (42.86%)	1 (2.38%)
7. I understand the criteria for Interprofessional Conflict Resolution.	0 (0)	2 (4.76%)	14 (33.33%)	24 (57.14%)	2 (4.76%)
8. The criteria of Interprofessional Conflict Resolution are reasonable for the course.	3 (7.14%)	1 (2.38%)	14 (33.33%)	21 (50%)	3 (7.14%)
9. I understand the criteria for Patient-Centred Care.	0 (0)	1 (2.38%)	13 (30.95%)	28 (66.67%)	0 (0)
10. The criteria of Patient-Centred Care are reasonable for the course.	0 (0)	2 (4.76%)	14 (33.33%)	25 (59.52%)	1 (2.38%)
11. I understand what an expected team performance looks like based on the criteria.	0 (0)	2 (4.76%)	17 (40.48%)	22 (52.38%)	1 (2.38%)
12. The course content covers all the competencies presented in the rubric.	1 (2.38%)	6 (14.29%)	16 (38.1%)	16 (38.1%)	3 (7.14%)
<b>Facilitator survey (n=14)</b>					
Did you view the Instructions for using the Feedback Rubric in eClass? = Yes (100%)					
<b>Items</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Not sure</b>
1. I understood how to use the rubric after the training.	0 (0)	1 (7.14%)	5 (35.71%)	8 (57.14%)	0 (0)
2. I understood all the criteria in the rubric.	0 (0)	0 (0)	9 (64.29%)	5 (35.71%)	0 (0)
3. The rubric was easy to use.	0 (0)	1 (7.14%)	7 (50%)	6 (42.86%)	0 (0)
4. I could identify the expected performance of each competency during the team assessments.	0 (0)	0 (0)	6 (42.86%)	8 (57.14%)	0 (0)
5. My feedback focused on the team actions.	0 (0)	0 (0)	8 (57.14%)	6 (42.86%)	0 (0)

6. I gave suggestions for improvement based on team actions.	0 (0)	1 (7.14%)	8 (57.14%)	4 (28.57%)	1 (7.14%)
7. I wrote feedback based on the four principles.	0 (0)	1 (7.14%)	10 (71.43%)	3 (21.43%)	0 (0)

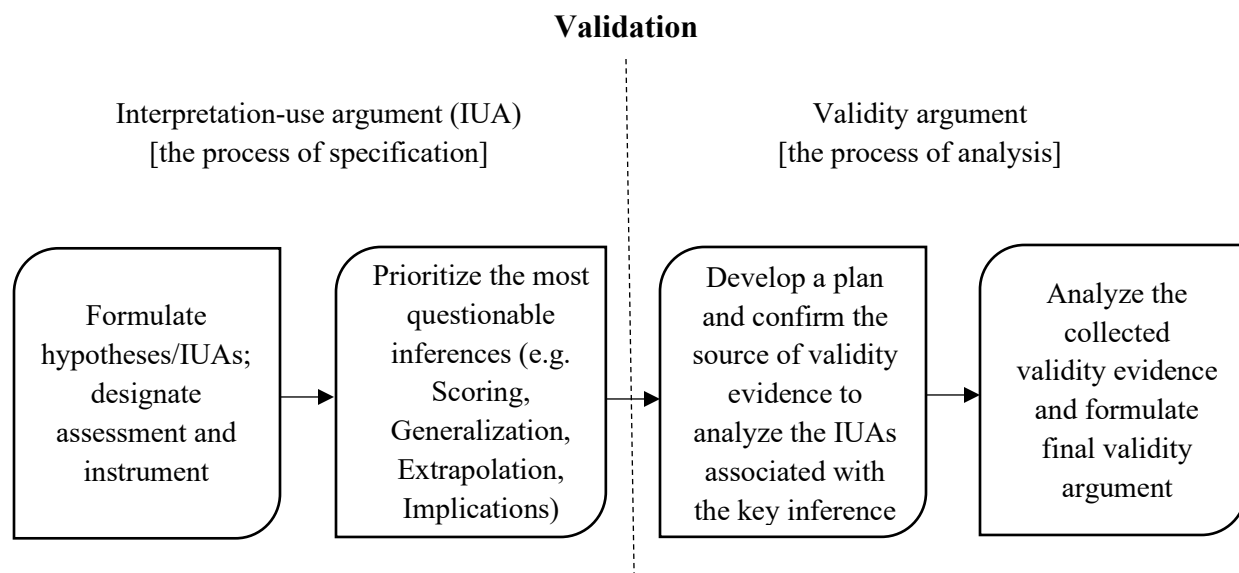
**Table 5. Descriptive analysis of the survey conducted in the elective course.**

<b>Student survey (n=7)</b>					
Did you view this rubric in eClass before completing the care plan assessment? = Yes (85.7%)					
<b>Items</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Not sure</b>
<b>Self-assessment rubric</b>					
1. I understood every criterion in this rubric.	0 (0)	0 (0)	6 (85.71%)	1 (14.29%)	0 (0)
2. I understood how to use this rubric to evaluate myself.	0 (0)	0 (0)	6 (85.71%)	1 (14.29%)	0 (0)
3. The criteria of the competencies in this rubric were reasonable for the course.	0 (0)	0 (0)	5 (71.43%)	2 (28.57%)	0 (0)
4. The rubric was easy to use.	0 (0)	0 (0)	4 (57.14%)	3 (42.86%)	0 (0)
5. I wrote structured feedback for myself by using this rubric.	0 (0)	0 (0)	5 (71.43%)	2 (28.57%)	0 (0)
6. The feedback was helpful for me to construct the reflection writing.	0 (0)	0 (0)	5 (71.43%)	2 (28.57%)	0 (0)
7. The feedback on the rubric gives me a direction to plan actions for improvement.	0 (0)	0 (0)	5 (71.43%)	2 (28.57%)	0 (0)
8. The feedback on the rubric motivates me in future IP learning.	0 (0)	1 (14.29%)	4 (57.14%)	2 (28.57%)	0 (0)
<b>Care plan assessment rubric</b>					
1. I understood every criterion in this rubric.	0 (0)	0 (0)	6 (85.71%)	1 (14.29%)	0 (0)
2. The criteria of the competencies in this rubric were reasonable for the course.	0 (0)	0 (0)	5 (71.43%)	2 (28.57%)	0 (0)
3. The criteria helped guide my team for completing the assignment.	0 (0)	0 (0)	5 (71.43%)	2 (28.57%)	0 (0)
4. The feedback written on this rubric from the instructor was structured.	0 (0)	0 (0)	6 (85.71%)	1 (14.29%)	0 (0)
5. The feedback from the instructor accurately reflected the quality of our care plan assignment.	0 (0)	0 (0)	6 (85.71%)	1 (14.29%)	0 (0)
6. The feedback was helpful for me to create better IP care plans in the future.	0 (0)	0 (0)	5 (71.43%)	2 (28.57%)	0 (0)
<b>Facilitator survey (n=3)</b>					
Did you view the orientation for using the single-point rubric before using the rubric? = No (100%), 1 person did not respond.					
<b>Items</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Not sure</b>
1. I understood all the criteria in this rubric.	0 (0)	0 (0)	0 (0)	3 (100)	0 (0)
2. I understood how to use this rubric.	0 (0)	0 (0)	1 (33.33%)	2 (66.67%)	0 (0)

3. The criteria of the competencies in this rubric were reasonable for the course.	0 (0)	0 (0)	0 (0)	3 (100)	0 (0)
4. The rubric was easy to use.	0 (0)	0 (0)	0 (0)	3 (100)	0 (0)
5. I could identify the expectation of each competency for a team.	0 (0)	0 (0)	0 (0)	3 (100)	0 (0)
6. The rubric helped me construct feedback.	0 (0)	0 (0)	1 (33.33%)	2 (66.67%)	0 (0)

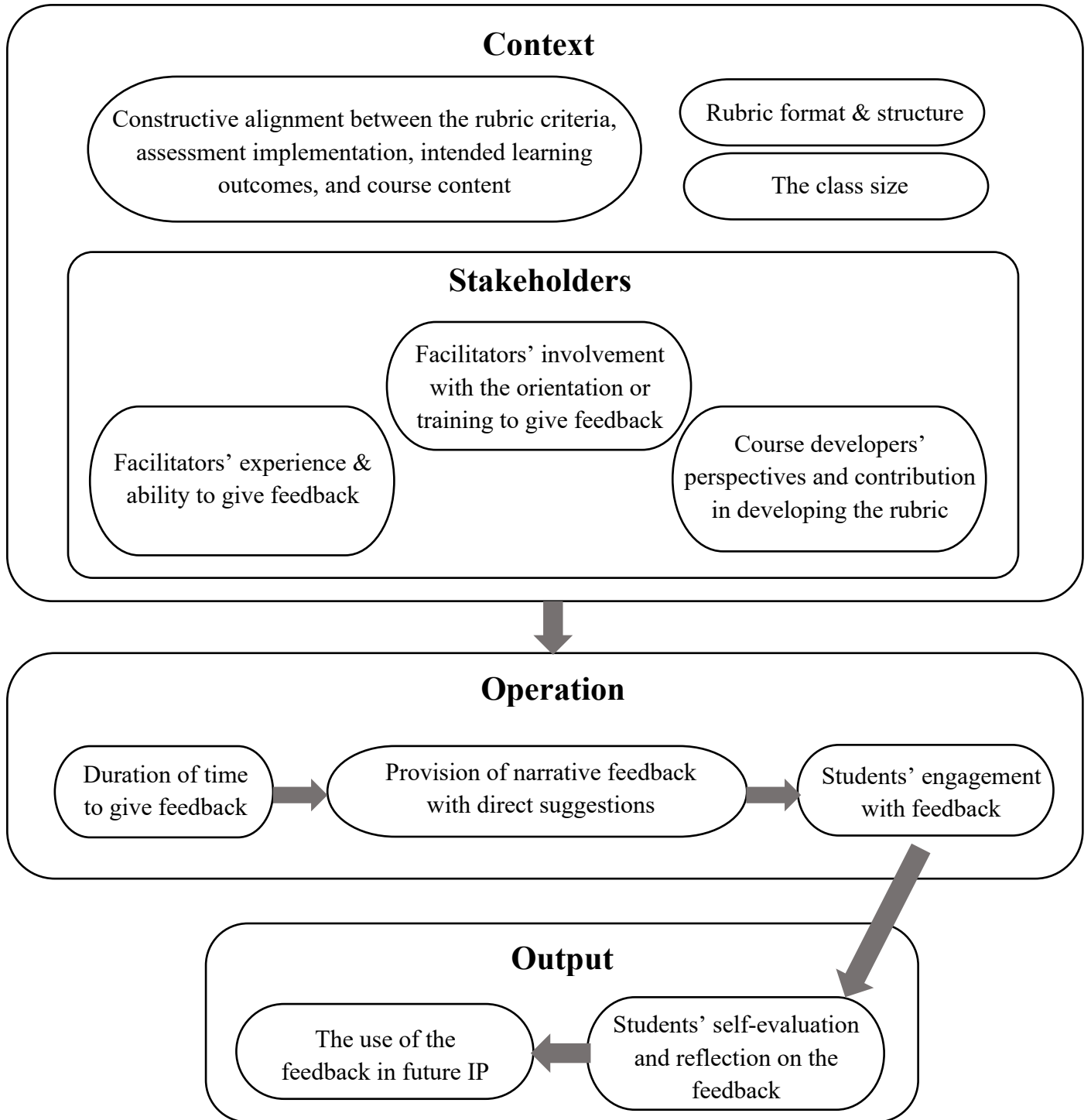


**Figure 1. Interprofessional (IP) Learning Pathway at the University of Alberta (HSERC, 2019).**



**Figure 2. The process of validation using Kane's validity framework (modified from Tavares et al., 2018).**





**Figure 3. A scheme of factors affecting the educational impact of using the single-point rubric in IP assessments.**