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Constructing Collaboration Across Campus: Pre-professional speech-language pathologists and teachers working together

by

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Dedication

To the sunrise.

And to all the people who provided me with caffeine in the last two years.

Abstract

This thesis project analyzed the efficacy of a single exposure to interprofessional education (IPE) for education and speech-language pathology (SLP) pre-professionals. The effects of IPE were shown through analysis of participant responses related to personal reflections, professional roles, communication and models of specialized service delivery in schools. Participants were graduate students from the Department of Speech Pathology and Audiology or undergraduate students from the Faculty of Education. The IPE experience consisted of online reflective surveys, an interactive seminar and the completion of a collaborative case study in small-groups composed of pre-professionals from both disciplines. Results indicated participants felt more confident in their own collaborative competencies, increased awareness and decreased use of discipline-specific terminology and increased knowledge of specialized models of service delivery after the IPE experience. The study also surveyed perceptions of pre-professional speech-language pathologists and teachers regarding professional roles and models of service delivery in the school.

Keywords: collaboration, communication, discipline-specific terminology, education, Interprofessional education (IPE), pre-professional, professional roles, reflection, schools, specialized service delivery, speech-language pathologist, teacher.

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Literature Review

Introduction

This literature review examines and synthesizes research in the area of interprofessional collaboration and interprofessional education (IPE), to support the necessity of IPE experiences for pre-professionals in the disciplines of speech-language pathology and education. However, the available research in these topic areas tends not to be methodologically or conceptually sound (Thannhauser, Russell-Mayhew & Scott, 2010). The following literature review will begin with a definition of collaboration and a rationale for professionals working together, in general and specifically in the fields of speech-language pathology and education. An overview of general models of collaboration and service delivery models for specialized speech and language services in school settings will highlight the possibilities available for speech-language pathologist and teacher interaction. The current status of collaboration between teachers and speech-language pathologists and service delivery models presently in use will also be discussed. Although there is evidence that classroom-based models are as effective as, if not more effective than, individualized education programs, consensus on the best model of service delivery is still unavailable (Cirrin, Schooling, Nelson, Diehl, Flynn, Staskowski, 2010, as cited in Flynn, 2010). Next, a summary of professional perceptions and identified barriers to collaboration will be discussed, shedding light on the nuances of collaboration and the potential for obstacles in realizing collaboration in schools.

Interprofessional education is conducted to improve the way professionals work together (Thannhauser, Russel-Mayhew & Scott, 2010). While there are many models and formats for IPE experiences, there is no consensus on critical components for the delivery methods or content. Despite varying forms of IPE experiences, there is some reported efficacy of all IPE programs (Reeves et al., 2008). In 2007, Hammick, Freeth, Koppel, Reeves, and Barr conducted a systematic review of interprofessional education, which provides some direction in developing structure for an IPE experience. The

literature review will provide evidence supporting an IPE program as a means of enhancing the practical education of pre-professional teachers and speech-language pathologists. To ensure clarity, henceforth 'pre-professionals' will refer to post-secondary students, and 'students' will refer to elementary and secondary students.

Definition of Collaboration

Collaboration can broadly be defined as the process by which individuals "labor together or work jointly in cooperative interaction to attain a shared goal" (Dettmer, Thurson, Knackendoffel, & Dyck, 2009, p. 8). This definition may be expanded to include the condition of frequent communication between the involved individuals (Hall & Weaver, 2001). Further, collaboration has also been described to involve team members of equal status contributing knowledge and skills (Rainforth, York, & Macdonald, 1992, as cited in Nochajski, 2001). One challenge in defining collaboration is that collaboration is not an outcome but rather the process by which the goal is achieved (Goldman, Zwarenstein, Bhattacharyya, & Reeves, 2009). Incorporating views found in the literature, the following definition of collaboration has been constructed:

> *Collaboration is a communication driven process in which individuals equally contribute their knowledge and skills to problem solve together and achieve a shared goal.*

It is interesting to compare the definition provided in the literature of collaboration with the way professionals define collaboration. Nochajski (2001) surveyed fifty-one teachers, occupational therapists, physical therapists, and speech-language pathologists and found that the majority of professionals define collaboration in terms of communication with team members, coordinating efforts across team members, working towards the same goals and objectives, and integrating services. Interestingly, less than half of the professionals discussed equality of roles and responsibilities, sharing of expertise and the problem solving process. Approximately one in five professionals equated collaboration and consultation in the survey, yet, in the literature, collaboration and consultation are described as distinct configurations of service

delivery. For more information on models of service delivery, please see the section entitled 'Models of Specialized Service Delivery in Schools' in this literature review. According to professionals, the meaning of collaboration can be summarized as:

> *Collaboration involves communication between team members so that individuals are able to coordinate efforts to integrate services and work to achieve a shared goal.*

The differences noted between the literature and the practical definition of collaboration highlights a gap between theory and interprofessional practice. In practice, professionals did not independently reference equality of different professionals or the view of collaboration as a process of problem solving rather than an outcome of communication between team members. However, the literature and professionals agree that a shared goal is crucial to collaboration. The way in which one defines collaboration will ultimately be reflected in how one engages in collaboration. Defining collaboration is just one step in understanding the complex process of professionals working together. It is important to also understand and establish the rationale behind bringing professionals together for a shared goal.

Purpose and Rationale for Interprofessional Collaboration

In today's world, where fragmentation of knowledge is caused by increasing specialization (Kerr, 1982, as cited in Hall & Weaver, 2001), the need for professionals to work together seen as a necessity in providing individualized care to meet the unique needs of each client. This is especially critical in cases where the needs of the client cannot be resolved by one profession alone and require contributions from a variety of professionals (Bronstein, 2003). In 1991, the American Speech and Hearing Association issued a statement that applies directly to speech-language pathologists and teachers; ". . .no one professional has an adequate knowledge base or expertise to execute all the functions associated with providing educational services for students" (as cited in Wright, 1996, p. 4). Wright (1996) found that speech-language pathologists and teachers indicated a commitment to collaborate for the benefit of the children they

were both serving. Both professions recognize that child development is complex and not the sole responsibility of one profession alone.

Current literature in most disciplines emphasizes the importance of collaborative interactions between professionals. A comprehensive rationale for collaboration between professionals comes from Willumsen and Hallberg (2003). With reference to interprofessional collaboration between speech-language pathologists and teachers, the most relevant arguments provided by Willumsen and Hallberg for collaboration are: to bring skills together, promote the sharing of information, ensure the continuity of care, ensure responsibility and accountability, and coordinate and plan the use of resources. Using the example of speech-language pathologists and teachers, each of these points can be exemplified. Teachers have specialized skills in the area of classroom management and curriculum and speech-language pathologists bring their specialized skills in the areas of speech and language learning. Collaboration allows parties to share information and in sharing areas of specialization, each profession is able to expand their knowledge base and incorporate another perspective into their practice. Increasing the continuity of care applies to teachers and speech-language pathologists, because students are better able use their skills in different situations when expectations are constant and enforced across environments (Paul, 2007). Collaboration increases responsibility and accountability, as there is a collective ownership of the goals. More than one professional is working on the same goal areas with a student, thus sharing in the success or failure of the goal. Ownership of success or failure is the responsibility of every member of the team and the team as a whole (Bronstein, 2003). An example of coordination of resources that can be achieved through collaboration would be the incorporation of classroom materials into speech and language intervention. The need for collaboration is emphasized across disciplines and the benefits apply to not just the client or recipient of the service but also the professionals involved.

Blau (1964, 1986, as cited in Wright, 1996) uses Social Exchange Theory to explain the personal rationale that professionals may have for engaging in collaboration. This theory is based on three principles. The first is that people will engage in an interaction only if the interaction provides a profit or benefit to them. Speech-language pathologists and teachers reported that they are personally and professionally rewarded by collaboration (Wright, 1996). Secondly, people have to make a commitment to the interaction. Wright (1996) found that speech-language pathologists and teachers are dedicated to collaboration primarily for the benefit of students. Finally, the theory states that as people engage in a collaborative interaction over time, the costs increase and the benefits can decrease. Wright (1996) found no evidence that professionals believed that familiarity decreased the value of collaborating. In fact, a survey of forty pairs of therapists and teachers showed that the majority of professionals reported that, the more they collaborated, the more they valued the collaboration (Wright, 1996).

Collaboration has been described as beneficial for professionals and the clients they serve. Many theoretical benefits of collaboration exist, however there is almost no research evidence showing direct benefits of collaboration. However, the perceived benefits of collaboration have provided a basis for a collaboration movement in many professions. Collaboration can take many forms and often the model of collaboration that is implemented depends on the environment and the purpose of the collaboration.

Models of Collaboration

Collaborative models can be examined in a variety of ways. Watts and colleagues (Watts, Guichard, Plant, Roderiguez, 1994, as cited in Hartas, 2004; Watts, Hawthorn, Hoffbrand, Jackson & Spurling, 1997, as cited in Hartas, 2004) proposed a typology that can be applied to all models of collaboration. They proposed graduated levels by which collaboration can be realized. The first level is co-operation, which is when two or more services co-operate on a joint task. The next level is co-ordination, which refers to when

professionals alter and align their working patterns. Cross-fertilization occurs when professionals exchange skills and cross professional boundaries. The last level of collaboration is called integration and this refers to a situation where professional boundaries are obsolete and no longer exist. This typology can be kept in mind as one explores different models of collaboration.

There are three general models by which professionals, such as teachers and speech-language pathologists, can collaborate; the multidisciplinary model, the interdisciplinary model, and the transdisciplinary model. In a multidisciplinary model, each professional remains distinct and there is minimal communication, although they may be working on the same case (i.e., with the same student). In a multidisciplinary model, cooperation is evident as per Watts and colleagues typology (Watts et al., 1994, 1997, as cited in Hartas, 2004). In an interdisciplinary model the professionals work together and communicate with each other, with an emphasis on holistic management, although each professional's specialized function is maintained. In the interdisciplinary model we see the essence of cooperation and coordination (Watts et al., 1994, 1997, as cited in Hartas, 2004). Finally, in the transdisciplinary model there is a large amount of professional overlap and every team member knows and is capable of assuming some aspects of the roles of other team members. In the typology of Watts and colleagues, the transdisciplinary model can employ all four levels, cooperation, coordination, cross-fertilization, and integration (Watts et al., 1994, 1997, as cited in Hartas, 2004). The transdisciplinary model requires maximum communication between professionals and relies upon the multiplicative or integrative effect where the results of the collaboration exceed the quality of product that would result from the simple 'adding' together the different professional skill sets. The additive effect would more likely result from the multidisciplinary model, where the team members are not integrating their knowledge and skills (Hall & Weaver, 2001; Paul, 2007, p. 24; Rawson, 1994, as cited in Williamson, 1995).

An expanded and more comprehensive list of collaborative models adds three more models to the framework above; parallel model, consultative model, and integrative model (Minore & Boone, 2002). The parallel model is where professionals work independently while being geographically close. In a consultative model, there is a referral system in place and experts are called in to comment and make recommendations on a case. For more information on the consultative service model please refer to the section of this literature review entitled 'Models of Specialized Service Delivery in Schools'. In the integrative model, a reliance on consensus building and synergy exist, along with a coordinated effort that engages the client as a whole person (Minore & Boone, 2002). In order to conceptualize the models and integrate knowledge, there is value in ranking the models along a continuum. An expanded list of the models in order of least integrative to most integrative would be: parallel model, consultative model, multidisciplinary model, interdisciplinary model, transdisciplinary model, and integrative model. Of course, there would be considerable overlap within these terms.

Knowledge of the different models of collaboration is theoretical. Before collaboration can be implemented in a system, one most consider the purpose of collaboration and then adapt the model of collaboration to fit the setting. In the case of speech-language pathologists and teachers, this means developing an understanding of the process of language learning in the classroom and examining the different models of specialized service delivery in schools.

Language in the Classroom

Speech-language pathologists and teachers work in the school system to help students achieve academic success and ensure students are equipped with functional skills to experience success in a variety of environments. However, as speech, language, and communication disorders are the most common childhood disability affecting 5.95% - 13% of the child population (Beitchman et al., 1986; as cited in Hall, 2005; Kleet et al.,

2000, as cited in Hall, 2005; Law et al., 2000b, as cited in Hall, 2005; Tomblin et al., 1996, as cited in Hall, 2005), many students may be at risk for academic challenges. Language difficulties are often called 'hidden impairments' and can have long term educational, emotional, and social implications for children affected (Dockerell & Lindsay, 1998 as cited in Hall, 2005; Hall, 2005). The integration of speech-language pathology and language learning into the classroom recognizes the importance of language to the curriculum and academic success, and gives relevant and frequent opportunities for language intervention to be functional and related to the students' real-life context (O'Toole & Kirkpatrick, 2007).

Spoken language and oral communication are recognized as critical components of the language arts curriculum (Miller, 1999). Oral communication is an important mode by which we convey ideas and interact with others (Tompkins, Bright, Pollard, & Winsor, 2005). By incorporating SLP services in the student's classroom experience, the potential for language learning to assist in social interactions and skills is increased (ASHA, 1999; Miller, 1999). As children with language learning difficulties are often identified as having associated social difficulties (Brinton, Fujiki & McKee, 1998, as cited in Prelock, 2000; Paul, 2007) bringing therapy to their daily interaction is important for the promotion of social success.

Beyond the need to express oneself through spoken language, there is also an intrinsic link between oral language and reading and writing. For example, phonemic awareness, the ability to manipulate sounds orally, is one of the best predictors for early reading skills (Catts & Kamhi, 2005). With the knowledge of the relationship between spoken and written language, there is an increased emphasis being placed on promotion of spoken language skills with students, especially those with language learning difficulties (Catts & Kamhi, 2005). As such, reading and writing instruction is formally recognized as part of the role of a speech-language pathologist (ASHA, 2001, as cited in Ukrainetz & Fresquez, 2003).

Another role of teachers and speech-language pathologists is to ensure students are equipped with functional and practical skills to succeed in the workplace. Nippold (2010) reports that with the economic downturn and the educational requirements for jobs that offer wages high enough to sustain a comfortable life-style, post-secondary education is almost becoming a requirement for employment. The language demands of a post-secondary program would pose challenges for a young adult with a language disorder. Therefore, speech-language pathologists in the school system can work with students to ensure comprehension of complex sentence structure and vocabulary, while developing verbal and written expression to a standard acceptable at a post-secondary institution. By providing students with supports to achieve at a level congruent to the demands of an institution of higher learning, speech-language pathologists and teachers are ensuring students will experience success and graduate from their further education. This in turn will help students attain the qualifications necessary to sustain employment throughout their lives (Nippold, 2010).

Speech-language pathologists and teachers are charged with ensuring academic and workplace success for their students. Speech and language intervention to students in schools can promote academic success and prepare students for post-secondary education and the workplace. With the understanding of the purpose of collaboration in the area of language, specialized models of service delivery can be examined to determine options for structuring service delivery to children with language difficulties.

Models of Specialized Service Delivery in Schools

In the school system, a shift has occurred in the typical model of collaboration between speech-language pathologists and teachers. Traditionally, the two professions worked in a parallel manner in the school system. Speech-language pathologists determined intervention goals and directly administered service outside the classroom in the areas of articulation, fluency, and voice disorders (ASHA, 1999; Elledge, Hasselbeck, Hobek,

Combs, Raisor-Becker & Creaghead, 2010; Paul, 2007). This type of intervention is often referred to as "pull-out" treatment. The "pull out" model allowed speech-language pathologists to set the context and reduce distractions to focus students' attention on remediation. Speech-language pathologists worked with individuals or small groups of students and were able to tailor intervention to meet the students' specific needs. Finally, language could be broken down and conceptualized in these sessions without being confounded by those areas of language that were not being targeted (Hartas, 2004). This "pull out" model has fallen out of favor because it can restrict learning and generalization and takes students out of the classroom, causing them to miss curriculum related information and activities (Prelock, 1997; Hartas, 2004; ASHA, 1999). "Pull out" programs have been characterized as being segregating and can result in negative stigmatization of students who need additional services (Ainscow, 1997, as cited in Hartas 2004).

Hartas (2004) describes an alternate framework that uses a consultative model as the basis of the interaction between teachers and speech-language pathologists. The speech-language pathologist's role in consultation is to provide information and rationale for intervention to professionals who are in direct contact with the students, such as teachers or educational assistants. This model has the speech-language pathologist observing students and providing advice based on those observations to the 'intervention agent'. In a consultative model, there would be limited mutual sharing of ideas or working together as the speech-language pathologist is viewed as the 'expert' with knowledge to pass along and the 'intervention agent' is expected to respect and accept the expert opinion of the speech-language pathologist. Consultation may take the form of 'modeling' where the intervention agent has the opportunity to observe the expert completing a task, 'coaching' where the consultant offers support and hints to the intervention agent, 'scaffolding' where there is a dialogue between both professionals, and 'fading' where the expert withdraws support as the intervention agent become more confident in his or her abilities (Hartas, 2004).

The limitations of both the "pull-out" and the consultative model have contributed to changes to recommended practice and the theoretical models underpinning the interaction between speech-language pathologists and teachers. In response to this, Hartas (2004) proposed a model of reciprocal consultation. This bidirectional consultation involves two professionals in complementary roles exchanging their expertise in reciprocity. For example, in schools, teachers would have expertise on curriculum and speech-language pathologists would provide information on the impact of language difficulties on learning, social interaction, and behavior in the classroom.

The Inclusion movement is a significant contributor to the restructuring of service delivery models for speech-language services in schools. The Inclusion movement, which is considered the best practice in special education, brought students with disabilities into the mainstream classroom (Nochajski, 2001). As a result, schools are challenged to work with a diverse population that requires additional support beyond traditional teaching. This necessitates a restructuring of service delivery models to ensure all student needs are being met (Bronstein, 2003; Nochajski, 2001). As such, a simple exchange of information, as proposed by the reciprocal consultation, may not meet the needs of all students.

In Alberta, the government published a document entitled *Setting the Direction Framework* in June 2009, which addresses the challenges schools in Alberta are facing and how they are intended to be addressed in the near future. This document stemmed from an inconsistency in assessment methods and the provision of support for students with exceptional needs. The goal of the document is to promote the creation of learning environments that support diverse learners in a unified education system. Collaboration is the method emphasized and includes collaboration between professionals and families, and any other individuals who are deemed as stakeholders in the students' education. The document outlines a few areas of priority, which are to be

addressed by bringing together stakeholders and professionals. The priority area of "Capacity" focuses on a system that is "equipped, resourced and ready to support and respond to needs of all students" (Government of Alberta, 2009, p. 9). The foundational process to promote capacity is collaboration between school staff, the use of learning teams, and promotion of professional development. There is also a plan to increase accessibility to expertise to support teachers and this will likely include speech-language pathologists. The recommendation is to develop a new service delivery model that is more efficient, coordinated, and culturally sensitive. The recommendations presented in the *Setting the Direction* document align with the inclusion movement and recognize of the importance of collaboration in providing the highest quality of education to students with exceptional learning needs (Government of Alberta, 2009).

The model that is currently emphasized in North America and the United Kingdom is a classroom-based model in which the speech-language pathologist provides service directly in the classroom in coordination with the teacher (ASHA, 1999, as cited in Diehl, 2003). Within the classroom-based model, speech-language pathologists can take on multiple roles to meet a diverse range of student needs. Classroom-based services can take on many forms, as teachers and speech-language pathologists are able to configure their service delivery approaches in many ways. Friend (2010, as cited in Flynn, 2010) identified seven service delivery approaches for classroom-based services (Flynn, 2010, p. 4):

- One teach, one observe – one observes while the other teaches
- One teach, one "drift" – one assumes primary teaching responsibilities while the other assists individual students
- Station teaching –each teaches at a separate center
- Parallel teaching – each instructs half the class using the same material
- Remedial teaching – one presents material while the other re-teaches previously taught material

- Supplemental teaching – one presents the lesson in a standard format while the other adapts the lesson
- Team teaching –both share teaching responsibilities

In 2000, Prelock published a comprehensive article outlining the roles of speech-language pathologists in inclusionary classrooms. Prelock (2000) identified six roles that could be assumed by a speech-language pathologist. Many of the roles identified involve the speech-language pathologist in the classroom setting. The first is a therapeutic role in which the speech-language pathologist supplements classroom instruction with intervention, as instruction may be insufficient for a student with a language learning impairment (LLI). This role would call for a speech-language pathologist to share teaching, teach in a pull out program or teach in a classroom for the students with LLI. The second role a speech-language pathologist can play is the role of a team member on a team that is child and family centered. Family-centered teams include the student and his or her family in all the aspects of the team, especially the decision making process. Family-centered practice promotes trust and respect for all stakeholders in the child's education (Government of Alberta, 2009) and broadens the context of any intervention to include contexts outside the classroom and therapy. The third role is embedded in a guided inquiry perspective and involves the teacher and speech-language pathologist providing meaningful and practical experiences to the student in a context that is related to the curriculum. The fourth role stems from a social interaction perspective that puts the emphasis on social skills learning. The speech-language pathologist would focus intervention on social skills and therefore would be directly involved in working with students and their classmates on cooperative group tasks. The scaffolding perspective looks to a classroom that consists of multiple levels of student achievement where students are taught in small and large groups based on achievement level. The speech-language pathologist would work in the classroom to support student development of individual academic strategies to aide learning. The scaffolding approach can also be extended to social skill areas, where

small groups of students can receive special instruction and practice in a certain social skill area. The final role of a speech-language pathologist can take in a classroom is a "research-to-partnership perspective". In this role, the speech-language pathologist's focus is on prevention through collaboratively teaching language skills in the classroom in a co-teaching situation (Elledge et al., 2010). The speech-language pathologist would work with the teacher to embed language-learning opportunities in classroom activities, which are derived from the curriculum. We can conclude that the role of the speech-language pathologist is varied and the extent of collaboration is highly variable across schools and classrooms (Prelock, 2000).

The actual service delivery models for providing specialized language services and roles and responsibilities of speech-language pathologists in schools are as varied as the theorized ways for these professionals to interact. Every speech-language pathologist-teacher interaction is unique as it is tailored to match the environmental context and student needs. There are many theoretical configurations that speech-language pathologists and teachers can use to provide specialized services to children in the classroom. The next section will discuss the current status of speech-language pathologist-teacher collaboration in schools.

Current Status of Collaboration between Speech-Language Pathologists and Teachers in Schools

In the field of education in North America, speech language pathologists and teachers typically work in close proximity. In 2004, the American Speech-Hearing Association estimated that fifty-six percent of speech-language pathologists are working in the school system (ASHA, 2004). However, there is little evidence that the full potential for collaboration in these scenarios is being realized. The collaboration configuration is highly dependent on the location of the speech-language pathologist (Wright, 1996). Sometimes speech-language pathologists are based in one school and only serve that school's population, while, in other situations, the speech-language pathologist visits a

few schools to provide services for a caseload that extend beyond one school (Wright, 1996; Hartas, 2004). In the latter situation, speech-language pathologists are often viewed as 'visitors' and members of a 'noneducational profession' (Hartas, 2004). This perception of the speech-language pathologist in schools is a potential barrier to implementing programs of service delivery that require professionals to work together.

Another factor to consider is the paradigm in which professionals operate. Speech-language pathologists are historically members of a health-care profession and may therefore have a tendency to approach their work from the medical model. The medical model is one where impairment is identified, a diagnosis given, an assessment of strengths and weaknesses is conducted, and a plan is developed to individually tailor intervention to the needs of the client (Hall, 2005; Hartas, 2004). This model is important to understand as it currently forms the basis for allocation of resources in a system. Children who require services are often identified through the medical model and then a prioritization process takes place where the children with the greatest needs receive the limited resources available (Hall, 2005). With a persistent shortage of speech-language pathologists (ASHA, 2000, as cited in Ukraintz & Fresquez, 2003), speech and language services are considered limited resources. When surveyed, speech-language pathologists feel they carry a caseload that is too large and spread across many schools (Kaegi, Svitich, Chambers, Bakker & Schneider, 2002, as cited in Ukraintz & Fresquez, 2003; Winsniewski & Gargiulo, 1997, as cited in Ukraintz & Fresquez, 2003). It is the medical model of deficit and disability that helps determine which students receive the limited services in the school system. There are some shifts in this medical model approach to services. In 2001, the World Health Organization published an International Classification of Functioning, Disability and Health (ICF) model as the current emphasized approach to impairments and disabilities. In this model, the individual's impairments are viewed in a holistic manner that shifts the focus to the impact of the disability on the individual's function within the context of the environment (WHO, 2001). With the WHO-ICF model replacing the traditional medical

model, language difficulties are being considered in the context of the classroom and a shift towards collaboration to address disabilities using a multifaceted approach is being driven forward by governing bodies (Government of Alberta, 2009).

Language in schools is an area of professional overlap between speech-language pathologists and teachers and the research is limited regarding the current demarcation of roles and responsibilities in the schools. According to a survey done by Ukraintz and Fresquez in 2003, speech-language pathologists have the specialization that enables them to facilitate development of written language; however they often work primarily in an oral context. It has been reported that most speech-language pathologists do not directly teach written language; instead they focus on speaking and listening skills with an expectation that these skills with transfer to the medium of printed language (Ukraintz & Fresquez, 2003). The population served by speech-language pathologists in the schools range from 'simple' cases (i.e., speech sound difficulties) to multiple difficulties that involved a combination of speech sound difficulties, comprehension problems, expressive language disorders, and pragmatic disorders. Hall (2005) found that the majority of speech-language pathologist cases were complex cases where multiple speech and language problems existed. Ukraintz and Fresquez (2003) found that all the speech-language pathologists they surveyed did some of their work in the area of articulation and place a great deal of importance on their work on speech sound production. Speech-language pathologists supplemented classroom education by providing assessment, determining eligibility for services, using curriculum to guide the lessons, and sometimes assisting and co-teaching in the classroom (Ukraintz & Fresquez, 2003). The role of teachers regarding language is primarily in the text and written form of language. Written language is often subsumed in the academic area of language arts and therefore often considered the domain of the teacher (Ukrainetz & Fresquez, 2003). Teachers are seen as responsible for academic language and speech-language pathologists do not tend to work with a central curriculum, and instead base their treatment on best practice in their field of research. Regardless of the specific area of

language that speech-language pathologists and teachers target in their professional practice, they reportedly used similar instruction methods. These instruction methods include discrete skill instruction, embedding instruction into meaningful activities such as comprehension questions, and participation in authentic curricular activities such as report writing (Ukraintz & Fresquez, 2003).

There is limited research providing insight to the reality of service delivery in schools. Ukrainetz and Fresquez (2003) reported that most speech-language pathologists worked in a pull-out format, with individual or small groups and direct instruction. Nochajski (2001) surveyed regular teachers, special education teachers, occupational therapists, physical therapists, and speech-language pathologists regarding the frequency of planning meetings they had with members of the other professions. Only 22% of participants reported that they attended monthly planning sessions involving therapists and teachers. None of the professionals reported attending weekly meeting with a variety of professionals.

Reports from this decade, while limited, show that speech-language pathologists primarily operate within the medical model to determine which students will receive limited services. Speech-language pathologists typically provide these services in the realm of oral language in a pull-out model of service delivery. Speech-language pathologists tend to work with students with complex cases and multiple language needs; however, they also consistently have children on their caseload with simple articulation needs. Earlier, this paper examined the potential for language services to occur in the classroom and the large variety of models of specialized service delivery that are possible to facilitate -teacher interaction. The reported reality in schools does not demonstrate a translation of theory into practice when it comes to collaboration between speech-language pathologists and teachers.

Reported Evidence of Effectiveness of Interprofessional Collaboration in Schools

Despite the increasing emphasis on collaboration between teachers and speech-language pathologists in the school system, evidence of this collaboration having a significant positive effect is scarce and scattered. Nochajski (2001) found that over 80% of teachers and therapists reported that collaboration helps student progress and attainment of educational goals, yet there is almost no observable evidence of this efficacy. Faber and Klein (as cited in Hanks & Velaski, 2003) showed that collaborative teaching was beneficial in a few measureable ways. As speech-language pathologists developed literacy and critical thinking in students, students showed an increase in verbal skills and better phonemic awareness. In addition, teachers used more questions that required higher language skills and both groups of professionals felt energized. The lack of evidence for the effectiveness of interprofessional collaboration may in part be due to the difficulty in assessing specific components of collaboration, and a lack of instruments that are valid and reliable (Thannauser, Russell-Mayhew, & Scott, 2010).

As research specific to the interprofessional collaboration in schools is limited, an expanded search for the efficacy of collaboration between speech-language pathologists and other disciplines was conducted. The research was also lacking. This is likely due to the difficulty in defining, quantifying and measuring changes in student or client performance under conditions of parallel models and collaborative models of intervention.

Barriers and Challenges to Interprofessional Collaboration

Researchers have conducted many studies looking at factors that hinder collaboration. While many factors have been identified, there have been recurring trends in identified barriers to collaboration specific to schools. The barrier that is most often cited can be categorized as ‘structural characteristics’ and therefore is out of any one individual’s control (Bronstein, 2003, Hall, 2005). Structural characteristics include professional culture supporting collaboration, administrative support, and time and space for

collaboration to occur. When surveyed, educators most often identified "time commitment/constraints and rigid organizational structure" as the most frequently identified barrier to collaboration (Hartas, 2004, p. 33). As speech-language pathology services are highly prioritized and service is provided on a basis of need, it can end up being rationed (Hall, 2005). There are only a limited number of allocated hours to speech and language services and, beyond that time, speech-language pathologists are inaccessible as collaborative partners (Hartas, 2004). In 2010, the American Speech Hearing Association found that 80-88% of speech-language pathologists reported a lack of time for collaboration as a top professional challenge. When Nochajski (2001) surveyed therapists and teachers, the majority of professionals identified a lack of administrative support, a lack of therapist presence on site at schools, and the time consuming nature of collaboration as primary barriers to collaboration. All of the above show that professionals agree that collaboration is chiefly hindered by structural constraints.

Another barrier to collaboration is general confusion over the collaborative process and how to accomplish successful interdisciplinary relations (Irvine, Kerridge, McPhee & Freeman, 2002). Irvine and colleagues (2002) went even further to describe interdisciplinary relations as characterized by conflict, suspicion, hostility and disparities. It is this lack of clarity that has resulted in twenty-five years of research trying to determine the theoretical underpinnings of successful collaboration (Schmitt, 2001). Bronstein (2003) identified knowledge of roles as one source of confusion in collaboration.

Role theory examines the impact of professional socialization on the collaborative process. Professional socialization occurs while pre-professionals prepare for their roles and the interactions they will encounter. This socialization provides a strong sense of the individual's professional role but could result in too stalwart an allegiance to one's own profession, which can hinder collaboration. Professional socialization can

contribute to professional hierarchies that result in a lack of equality between the professionals, clashing ideologies and inaccessible vocabularies (Hartas, 2004). Bronstein (2003) also discusses the individual and personal characteristics that can influence the success of collaboration. These include attitudes, respect, and history of collaboration, as a lack of early experience with collaboration has been linked to a decreased amount of success in collaboration (Mattessich & Monsey, 1992, as cited in Bronstein, 2003).

Aside from structural constraints, most barriers to collaboration seem to result from a lack of awareness of roles and the process of collaboration, coupled with a narrowed mindset regarding the other profession and their roles, due to professional socialization. It has been proposed that Interprofessional education is a way to improve the way professionals work together (Thannhauser, Russell-Mayhew & Scott, 2010).

Rationale to Include Interprofessional Education in Pre-Professional Post-Secondary Education

Interprofessional education (IPE) has been defined as "those occasions when members (or students) of two or more professions learn with, from and about one another to improve collaboration and the quality of care" (Hammick et al., 2007, p. 736). IPE goes beyond multiprofessional education where "members of two or more professions simply learn side by side whatever the purpose" (Hammick et al., 2007, p. 736) and requires participants to interact with individuals from different disciplines. With a push for collaboration in work settings, it would seem practical to provide pre-professionals with education in collaboration before the commencement of their careers.

The basis of IPE can be identified in the Contact Hypothesis proposed by Sherif (1996, as cited in Wright, 1996). The Contact Hypothesis is based on the principle that the more time people spend together, the more positively they view each other. The three tenets of the Contact Hypothesis are that people tend to favor their own groups, contact with individuals outside their own group increases knowledge of similarities and differences,

and finally that conflict decreases when an overarching goal is introduced. Therefore, IPE is viewed a way to break down professional boundaries and help professionals work together (Barrett et al., 2003, as cited in Hall, 2005). In addition to the Contact Hypothesis, Wright (1996) proposes that spending time together is not sufficient to create collaborative partnerships. Cognitive gain is necessary to provide value to contact. Cognitive gain refers to the acquisition of knowledge from an individual outside one's own group. Cognitive gain or the exchange of information between individuals is one of the major benefits of working together. Together with the Contact Hypothesis, cognitive gain forms the theoretical foundation for IPE.

Beyond a theoretical foundation for collaboration, there is also a structural push for collaboration. The top-down drivers for IPE include government policy and the amalgamation of government, professional and public sectors in an effort to decrease the amount of error made in the professional realm (Hammick et al., 2007). There is also a growing bottom-up movement that is encouraging IPE to support professional activity in complex cases (Hammick et al., 2007). The majority of speech-language pathologists and teachers in a survey conducted by Hall (2005) desired joint professional training. IPE adds another dimension of enhancement to professional programs. Woods (2007) considers the inclusion of interprofessional education to be educationally beneficial as it pushes pre-professionals to engage their own discipline in a critical fashion, examine the specialized knowledge they have, and acknowledge the limitations of their field when viewed from another perspective. Spelt, Biemans, Tobi, Luning, & Mulder (2009) advanced this notion by rationalizing that interdisciplinary education encourages pre-professionals to integrate their knowledge into other disciplines and reach conclusions that would have been unattainable by one discipline alone (Spelt et al., 2009).

In 2010, the World Health Organization published a Framework for Action on Interprofessional Education & Collaborative Practice. This document identified IPE as a

"necessary step in preparing a 'collaborative-practice ready health workforce'" (p. 7). The Framework identifies the benefits of IPE as (p. 17):

- Students have real world experience and insight
- Staff from a range of professions provide input into program development
- Students learn about the work of other practitioners

Elledge and colleagues (2010) suggest that, in order to facilitate interdisciplinary studies, a course be created across the disciplines of education and speech pathology that would have the objective of developing skills in the area of organization, time management, conflict resolution, and professional flexibility. They suggest that teachers and speech-language pathologists learn in conjunction with the other profession. They also suggest that collaborative coursework will not be enough to ensure a thorough understanding of the intricacies of collaboration and advocate for pre-professional collaborative placements.

The overall structure of an IPE course for teachers and speech-language pathologists could take many forms. Cook (2005, as cited in Margison & Shore, 2009) outlined all IPE initiatives in Canada, regardless of disciplines involved. The report showed that IPE currently takes many different forms across a variety of disciplines. Cook (2005, as cited in Margison & Shore, 2009) documented four forms of IPE initiatives that are currently in use across Canada: elective programs, intermittent discussions of IPE (i.e. modules), full courses on interprofessionalism, and clinical placements in interprofessional teams. Specifically regarding speech-language pathologist-teacher collaboration, a collaborative training program is underway at the University of Cincinnati, where pre-professional speech-language pathologists, special educators and educators receive instruction together, complete class projects together and then work jointly in a practical setting. The University of Cincinnati has taken the initiative to create a program in response to the growing camp that advocates exposure to collaboration prior to graduation and entry into the workforce (Elledge et al., 2010). While IPE initiatives are growing across

North America, there is still a desire to implement more widespread integration of IPE into curricula of the speech-language pathology and education disciplines.

Method for Interprofessional Education (How to Teach IPE)

In 1993, Biggs reviewed resources and created a tool for analyzing IPE experience. This 3-P model will be used in the discussion of creating the structure for a successful IPE experience. The three 'P's' are Presage factors (contextual and structural decisions), Process factors (approaches to teaching and learning), and Product factors (outcome measures) (Biggs, 1993, as cited in Hammick et al., 2007).

Presage (contextual considerations).

Timing of delivery of IPE. Timing of the interprofessional experience is an important consideration when planning the method of delivery of IPE. IPE timing should balance educational experience and early exposure to maximize success. There is a perspective that advocates that IPE experiences take place early in the educational program before negative professional socialization takes place and pre-professionals become too immersed in their own fields (Horak 1998, as cited in Hall & Weaver, 2001; Paresl & Bligh, 1998, as cited in Freeth & Reeves, 2004). The counterargument suggests that pre-professionals should be secure in their competency in their own discipline before engaging in interprofessional activities. Some individuals even advocate that collaborative education is inappropriate for undergraduate pre-professionals, as they do not possess a solid foundation of knowledge to engage in a higher order task such required in IPE (Hall & Weaver, 2001). A logical resolution is to target collaboration at many points throughout the post secondary education careers of pre-professionals. In doing so, IPE can build on the knowledge that is available to the pre-professionals at the time, and scaffold to higher levels of knowledge (Hilton, Morris & Wright, 1995, as cited in Freeth & Reeves, 2004; Miller, 1999).

Other presage factors. In the systematic review published in 2007 by Hammick and colleagues, mentioned a few other presage factors. These included learner profession and numbers. The systematic review found that ideally the IPE should be delivered to a large group of pre-professionals from a wide variety of backgrounds. In the review, Tucker and colleagues (2003) were cited as identifying that "timetabling the sessions to identify times when all students were free was problematic" (p. 634, as cited in Hammick et al., 2007). In a study that looked at the longitudinal effect of IPE on attitudes, it was found that students often identified scheduling an IPE experience in an evening time slot outside of the regular class schedule as an aspect they would like to see changed in the future (Curran, Sharpe, Flynn, & Button, 2010). Finally, the systematic review identified that the characteristics of the IPE instructor should be considered in the creation of an IPE experience. Hammick et al. (2007) suggested that IPE instructors stand as models and should collaborate with other instructors whenever possible. Ponzer and colleagues (2004) found that the "quality of supervision was the most important contribution to student satisfaction" (p. 735, as cited in Hammick et al., 2007).

The current body of literature suggests the context of IPE be structured in a problem-based context at many points throughout the education process for a large variety of professionals. Ideally, the IPE experience would occur during regular class time and be taught by an expert practitioner of interprofessional collaboration.

Process factors (teaching and learning).

Organizational theory for IPE. Lattuca, Voight, & Fath (2004) described four theories of interdisciplinary education, each of which can be applied successfully in a university setting. Informed disciplinarity is a theory that has one single discipline as the central focus, but calls upon other disciplines to illuminate content. A course that infuses examples from other disciplines into a context that is dominated by one

discipline is an example of informed disciplinarity. Synthetic interdisciplinarity combines theories and concepts from a variety of disciplines but all the disciplines remain distinct. Courses taught at the Center for Bioethics at the University of Pennsylvania can be categorized as synthetic interdisciplinarity as a single professor brings all relevant fields together to inform an issue and pre-professionals are expected to think systematically about the issue using logic to make a recommendation (Nikitina, 2005). Transdisciplinarity is a theory that turns the focus away from the source of the ideas and brings disciplines together in a coherent manner. Team-taught seminars at the Swarthmore College in Pennsylvania would fall under this, as all perspectives are considered and then pre-professionals are asked to stake their own ground based on the merit of the ideas versus the source of the idea (Nikitina, 2005). The final theory that could be applied to IPE is conceptual interdisciplinarity, which is similar to transdisciplinarity as there is no single focus. However, unlike transdisciplinarity, conceptual interdisciplinarity strives for a perspective that is based on a social factor such as culture, gender, or power instead of a discipline. Miami University offers a course entitled "Kid's Stuff: Toys and Modern American Society", which examines the development and significance of toys in modern America. This is an example of a conceptual interdisciplinarity course (Lattuca, Voight, & Fath, 2004).

Philosophical underpinnings of collaboration for IPE.

Taxonomy of Disciplines: Anthropological Perspective. Becherr and Trowler (2001, as cited in Woods, 2007) provide a collaborative philosophy that can underlie the content of teaching and learning in IPE. Their philosophy views collaboration as bringing together two distinct disciplines (or tribes) who are "inseparably intertwined" or "mutually infused" in their domains (or territory) (Becherr and Trowler, 2001, p. 23, as cited in Woods, 2007, p. 857). By examining this phenomenon from an anthropological perspective, insights into language and cultural gaps are made more salient. In a program based on this philosophy, pre-professionals would be taught about the other

discipline's culture and become more aware of subtleties of culture and language and the difficulty of characterizing another discipline. Also, pre-professionals would be encouraged to confront stereotypes and perceptions of the other discipline(s).

Intercultural communicative competence. Byram's model of Intercultural Communicative Competence (2001, as cited in Woods, 2007) expands on the work of Becherr and Trowler (2001) and looks more at the process of collaboration between the distinct cultures of disciplines. In order to successfully bring cultures together, Byram identifies three areas of linguistic competence and five areas of non-linguistic competence that can enhance interactions. Each of these areas is applicable and could be addressed through the curriculum of IPE. Linguistic areas include linguistic competence (ability to produce written and spoken standard language), socio-linguistic competence (ability to understand the subtle nuances of language and negotiate meaning when it is not transparent), and discourse competence (ability to use, discover and negotiate strategies to produce and interpret spoken and written language). Non-linguistic areas of competence would include attitudes and a willingness to seek out and engage in new relationships, knowledge of their own discipline and application of this knowledge to problems and negotiation of meaning. These non-linguistic skills also include written work such as skills in the area of interpreting documents from different disciplines. Finally non-linguistic skills include critical thinking skills such as ability to discover and acquire new knowledge and an awareness that facilitates a critical view of practice and products of their own and other disciplines. Preparing pre-professionals with a strong knowledge in their own discipline and equipping them with the skills to access information for, and from, other disciplines will greatly assist in interprofessional learning. Pre-professionals should also be well informed on the process of collaboration and team formation, which will allow for willingness to engage and participate. Finally, Byram (2001, as cited in Woods, 2007) encourages pre-professionals to learn how to use language to their advantage when talking to individuals who may not be versed in their vernacular and being conscious of what language is specific to their discipline.

Method of IPE delivery. An early consideration when developing an interdisciplinary education program is the method that will be used to teach pre-professionals the theory and process of collaboration (Hall & Weaver, 2001). IPE can integrate theory and actual application of the collaborative process. It can force pre-professionals to critically appraise a situation and conclude upon a solution (Hall & Weaver, 2001). Context plays a significant role in collaborative situations and can impact behaviors and relationships (Boaden & Leaviss, 2000). A problem-based learning model where pre-professionals learn to collaborate with other professions through a focus group that examines a case study and determines group goals and intervention approaches is the method that is currently favored. A problem-based learning model integrates theory and application as well as attempts to contextualize the learning (Hall & Weaver, 2001; Lingard, Espin, Evans & Hawryluck, 2004). A problem-based model also fosters an appreciation for the process and application of collaboration as individuals work together to accomplish goals that would be difficult for an individual to complete independently (Wilson, 1998 as cited in Hall & Weaver, 2001). Lattuca, Voight, and Fath (2004) advocate for the constructivist approach that focuses learning around the pre-professional. They emphasize educational theories where the learning is structured around the pre-professionals' prior knowledge, their attitudes, and their interest. IPE can consist of meaningful interactions allowing pre-professionals to construct their understanding. When surveyed, IPE participants reported the highest levels of satisfaction in authentic learning situations (Curran, Sharpe, Flynn & Button, 2010). As such, case based learning and problem-based learning has been identified as the best practice in IPE.

In order for learning in IPE to be of the highest caliber, pre-professionals will have an opportunity to construct their own meaning through dialogue and shared activity and through problem-based learning (D'Eon, 2005, Oandasan & Reeves, 2005, Steinert, 2005, as cited in Curran, Sharpe, Flynn & Button, 2010).

Other process factors. Determination of process factors in IPE is an area of continuing development. IPE facilitators need to be trained and continue to develop their skills in facilitating and creating collaborative opportunities (Morey et al., 2002, as cited in Hammick et al., 2007; Reeves & Freeth, 2002, as cited in Hammick et al., 2007). A second variable of learner choice was discussed. In 16 of the 21 studies used in the meta-analysis conducted by Hammick and colleagues (2007), some degree of choice was given to learners. The main choice of whether or not to participate in the IPE experience was discussed on multiple occasions in the research. In 2004, Kilminster and colleagues learned that there was no difference in measured outcomes between groups of students who opted to participate in the IPE experience and students for whom the IPE experience was compulsory (as cited in Hammick, et al., 2007). Another process factor that has been discussed in the literature is the adaptability of the experience to the student learning. IPE experiences should be relevant and appropriate to the participants. While this is most prominent in medical training and the use of simulated patients, the basic premise of designing an IPE experience that allows students to apply their knowledge can be used in all IPE experiences (Hammick et al., 2007).

The teaching and learning of IPE strives to integrate the perspectives of all participating disciplines. If the IPE subscribes to a philosophical understanding that IPE involves the bringing together of two disciplines with different cultures and language, the IPE will teach participants about the similarities and differences between groups that can arise from communication differences. Finally, there is no evidence to suggest that IPE has to be a voluntary endeavor in order to be effective.

Product factors (learning outcomes).

Content of interprofessional education (what to teach in IPE). The focus of the curriculum for interprofessional education is highly dependent on the desired outcomes

of the program. The essential skills of interprofessional collaboration will assist in development of content and focus. Five recurring areas of skill development are consistently referenced in successful collaboration and are therefore often included in the curriculum of IPE. These areas are knowledge of professional roles, communication skills, team formation, collaborative skills and reflection (Dettmer et al., 2009; HSERC, 2010). When Nochajski (2001) surveyed professionals, the majority of therapists and teachers reported they would like information about team member roles and responsibilities, the team process, and collaboration from an IPE experience.

Knowledge of professional roles. Determining and clarifying professional roles is consistently identified as being a point of contention in collaboration. The first step in collaboration is to determine the expected scope of practice for each profession that is contributing to the goal (Betz, Raynor & Turman, 1998; Bronstein, 2003; Mu, Chao, Jensen, & Royeen, 2004). A necessary collaborative competency is the ability to describe one's own professional roles and responsibilities to other professions as well respect and recognize the roles and responsibilities of other professions (Freeth & Reeves, 2004). Clarifying roles will counteract stereotyping and oversimplification of the roles of team members (Irvine et al., 2002). Almost half of teachers and therapists surveyed by Nochajski (2001) indicated a lack of knowledge about professional roles of others.

In general, the role of the speech-language pathologist in the school is to "attend to delays and disorders of speech, language and communication" and the role of a teacher is to "instruct in functional and academic skills" (McCormick, Loeb, & Schiefelbusch, 1997, p. 175 as cited in Ukrainetz & Fresquez, 2003). Collaboration between educators and speech-language pathologists is accomplished when therapists take into account the education context and teachers understand the importance of language to the whole curriculum and all parties realize that speech and language have implications that

penetrate all areas of communication, spoken and written (Kersner & Wright, 1996, as cited in Munoz & Jeris, 2005; O'Toole & Kirkpatrick, 2007).

Bronstein (2003) describes a process of role socialization. Role socialization occurs when pre-professionals learn their professional roles independent of interaction with other professions. Without interaction during the formation of professional identity, pre-professionals may not realize when their role is extending into the territory of other professionals. For example, both speech-language pathologists' and teachers' scope of practice extends into the area of literacy (Ukrainetz & Fresquez, 2003). Sometimes, these points of overlap result in contention as professionals become territorial in their areas of specialization, termed "professional turfism" (Bronstein, 2003).

To counteract professional turfism, professionals must learn to share roles or create boundaries and clear distinctions between roles, called "role delineation". The highest level of role sharing takes place in the transdisciplinary model. If the idealized transdisciplinary model is in place, every member of the team is competent and confident in assuming most of the roles present in the team (Paul, 2007). In order for the transdisciplinary model to be implemented, every professional must be prepared to release some aspects of their role and place confidence in the other members of the team to participate in those aspects. Professional roles will be extended to include new skill sets from different professions. Professionals must exchange and receive information, and be confident in their team members' abilities to assume their roles (Wodruff & McGonigel, 1988, as cited in Prelock, 1997). Some responsibilities would remain distinct, as it is unethical for professionals to assume roles beyond their professional capacity. For example, a speech-language pathologist has specialized training and certification in order to perform a swallowing assessment, and this would not be shared between the two professions (ASHA, 1999). In order for role delineation to take place, professionals must first be able to express their areas of expertise and negotiate, via effective communication, the responsibilities that will remain distinct.

It has been recommended that IPE provide pre-professional students a chance to practice their skills in describing their own roles and responsibilities while learning and understanding the roles and responsibilities of another discipline. This may prevent the development of negative stereotypes and narrowed views of the other discipline while helping pre-professionals learn to advocate for their own discipline.

Communication. Communication permeates all human interactions and is a critical skill for effective collaboration. One of the main failures of interprofessional communication is in regards to specialized and discipline-specific vocabulary. Team members are also encouraged to engage in conversations related to the structure and formation of teams and this requires a higher-level and theoretical use of language.

As individuals specialize in a professional field, their lexicon is developed through a socialization process that results in a vocabulary that is often inaccessible to those outside of the discipline (Hall & Weaver, 2001). Students become fully immersed in discipline-specific terminology, which can sometimes result in an unconscious use of jargon terms. In a collaborative situation, this issue of specialized vocabulary can be intuitively counteracted with a jointly developed and shared terminology. However, even a shared vocabulary can cause problems as individuals may become frustrated and begin to resent having to use terms that have discipline specific connotations in a different way to accommodate all team members (Irvine et al., 2002). In a study that asked early-childhood educators about collaboration with speech-language pathologists, a factor identified as a reason for failures in communication was the difference in professional vocabularies and the time consuming nature of asking for clarification from speech-language pathologists who were often inaccessible due to structural organization (Hall, 2005). Wright (1996) found that professionals reported a different vocabulary between professions. A nursery nurse surveyed stated “they (speech-language pathologists) sent some sheets, I didn’t really understand them. . . and it was

obviously something that was really familiar to themselves and (we didn't know) what it was used for. . .I wasn't really sure what to do with it. . ." (Hall, 2005, p. 17). Hall (2005) also found that teachers preferred practical suggestions, which were not commonly provided by speech-language pathologists. The onus to seek this clarification was on the teachers, but teachers reported that, even though help was forthcoming when requested, seeking clarification was too time consuming (Hall, 2005). IPE can help pre-professionals learn to identify their discipline specific terminology and define it in a way that is understandable to individuals outside their profession.

Communication skills can be expanded into the area of interpersonal skills and discussing the structure of the team itself. Research has shown that 22% of all interactions in a team are concerned with team function and organizational issues, therefore the communicative competencies of the team will play a large role in the efficiency of the collaboration (Patel, Cytryn, Shortliffe, & Safran, 2000). "Professional expansion" is a common phenomenon whereby one individual dominates the discussion thereby limiting the opportunity for other parties to contribute (Betz, Raynor & Turman, 1998). IPE can help pre-professionals learn to communicate in a team through practice interactions and teaching the basic structures of teams and the roles of individuals within teams. Familiarizing pre-professionals with the terminology of collaboration allows them to share a basic set of vocabulary that can be used within a team, such as establishing the roles and responsibilities of a team 'leader' versus the team 'motivator'.

An IPE experience should give students an opportunity to practice their skills in communication. As the primarily identified barrier to collaboration between speech-language pathologists and teachers is a lack of shared terminology and the unconscious use of discipline-specific terminology by both professions, an IPE experience should provide authentic experiences for pre-professionals to become aware of, and reduce, their use of discipline-specific terminology. IPE should also provide a framework for professionals to discuss the process of collaboration with shared terminology.

The process of team formation. The process by which the team itself comes together often follows a predictable pattern and IPE can provide knowledge and skills in the area of team formation. Team members who are aware of the process will intuitively understand the situation of collaboration that they are participating in and might approach the conflicts that arise with a perspective that looks forward towards establishing an effective team. Tuckman's Model of Group Development addresses areas of potential contention in a realistic manner (Hall & Weaver, 2001). The model describes stages in which the team must progress. The first stage is the forming stage in which the team comes together and commences on task-oriented behavior to establish the goals and objectives. In professional collaborations there is a described tendency for 'professional etiquette' where social formalities are dropped for the sake of efficiency. The professional etiquette strips away normal social elements of communication, which can be frustrating and lead to an impersonal and formal collaborative experience during the forming stage (Reeves & Lewin, 2004). The team then moves swiftly into the storming stage where the team reacts to problems and conflicts begin to arise. At this point the fate of the team is decided; it can be disbanded or continue forward into the norming stage. The norming stage is the point at which the team negotiates and establishes cooperation. Ideally, by this stage, the pretence of professional etiquette will be dropped and the team can reach the final stage of performing. In the performing stage, tasks are accomplished via mutual respect and established relationships.

Lowe and Herranens (1982) provide another useful description of the steps involved in the formation of an efficient and effective team that can easily be applied to any collaborative situation (as cited in Peña & Quinn, 2003). The team starts off by getting acquainted and then moves into the trial and error stage where there is ambiguity of roles and the coordination and facilitation of assumed roles occupies the majority of the team's energy. This stage, much like the forming stage in Tuckerman model, can be

affected by professional etiquette. The next stage of collective indecision is the phase in which members try to maintain equilibrium and avoid conflict. The collective indecision phase gives way to the crisis stage where the team is forced to recognize their ineffectiveness. At this point the team either dissolves or continues on to the resolution phase where a genuine attempt is made to work together and communication strategies are implemented. The team then progresses to the team maintenance stage where conflicts are dealt with efficiently and there is a mutual respect.

A thorough understanding of the natural stages of team formation would equip pre-professionals with knowledge that can contribute to patience and understanding throughout their collaborative experiences. The value of understanding the process of team formation and sharing the same terminology for team formation allows team members to have efficient discussions of the status of their team and the future stages that may occur. Knowing where the team is, and where they will be going, could be of value to individuals who are new to collaboration.

Collaborative skills. Collaborative skills are inclusive of all the processes and strategies that have been identified to promote a more fluid and successful collaboration. Teams should be able to identify their common goal, posses multiple collaborative competencies, and reflect effectively and efficiently on the collaborative experience.

A team should collaborate to achieve or make progress towards a common goal. The strategy of developing “idea dominance” allows team members to discuss and determine their common goal. Idea dominance refers to the clear idea or focus for the team so that each member can recognize success and failure within themselves and the team as a whole (Hall & Weaver, 2001). Idea dominance ties directly to the ownership of the case. Collective ownership forms the core of the collaborative experience as team members negotiate and contribute their knowledge as a commodity to achieve

the goal (Lingard, Espin, Evans & Hawryluck, 2004). Bronstein (2003) goes further to add the concept of interdependence as a central component of effective collaboration. When a task is brought to a collaborative team, there must be a realization that one team member or profession alone cannot accomplish the task. It is the coming together of the professions that will allow for success, a term coined "integrative effect". Integrative effect, explains that professionals working together have a multiplicative effect versus the additive effect of simply bringing together a variety of professional opinions (Rawson, 1994, as cited in Leathard, 2003). Lowry and colleagues (2000) summarize by identifying an assumed foundation for collaboration in the commitment to the common goal, an understanding that collaboration is necessary, and a respect for all team members (Lowry, Burns, Smith & Jacobson, 2000). The individual participating in the collaboration could also have a set of collaborative competencies that involve effective communication of role and responsibilities to other professions, respecting and recognizing the unique competence of others, coping with uncertainty, facilitating meetings, handling conflict, and working together to assess, plan and provide intervention (Freeth & Reeves, 2004).

Finally, pre-professionals can reflect on their experiences with collaboration. Reflection is a practice that is often overlooked but can be powerful in contributing to the collaborative experience. Reflection is an effective teaching approach to interprofessional education that fosters the development of individual skills (Hammick et al., 2007; Mu, Chao, Jensen & Royeen, 2004). The impact of reflection on actual practice is difficult to measure as reflection is a personal and individualized process and is not consistent across individuals. Also, when individuals are asked to reflect on their confidence in areas of competencies, the reported confidence score may not correlate with observed competency (Hall, 2005).

IPE experiences should give pre-professionals an opportunity to practice their collaborative skills in the area of developing a common goal, negotiating roles,

communication, conflict management, and reflection. Competencies in these areas have been implicated in successful collaboration, and through authentic learning situations, pre-professionals should be given the chance to engage in collaboration to determine their own strengths and weaknesses in these areas.

Other product factors. In their systematic review of the current literature, Hammick and colleagues (2007) identified that knowledge, skills and attitudes are the most oft cited learning outcomes from IPE experiences. Most studies reported on the perceptions and attitudes of participants towards other professions and teamwork (Carpenter, 1995, as cited in Hammick et al., 2007; Tunstall-Pedoe et al., 2003, as cited in Hammick et al., 2007). The systematic review identified six studies that documented changes in participant behaviors; however, these behavioral changes were largely documented in personal reflections completed by participants themselves. Finally, some studies have tried to capture long-term outcomes of IPE in relation to service delivery and in the care of patients and clients. Measures have included morbidity, number of clinician errors, patient satisfaction, and volume of patients in health care (Dienst & Byl, 1981, as cited in Hammick et al., 2007; Horbar et al., 2001, as cited in Hammick et al., 2007; Morey et al., 2002, as cited in Hammick et al., 2007; Reeves & Freeth, 2002, as cited in Hammick et al., 2007). All of these measures have shown positive results after IPE.

The intended outcomes of IPE can be highly varied. IPE experiences are usually designed to provide information on professional roles, communication skills, the process of team formation, and collaborative skills such as identifying a common goal and reflection. The majority of current studies available used attitudes and perceptions of collaboration as outcome measures, and there is a lack of information related to the efficacy of IPE in achieving all intended learning outcomes.

Bringing Structure to Interprofessional Education Curriculum. In an attempt to bring together all the components and philosophies of IPE, Woods (2007) proposed a framework for IPE curriculum. In preparation for collaboration, pre-professionals are taught about their own discipline, the tenants of rational problem solving involving other disciplines, how to teach terminology that is discipline specific, to critically examine their own discipline in practice and to create products such as publications. The framework then provides pre-professionals with interdisciplinary collaboration experience through larger scale projects in a problem-based learning format. The process ends with pre-professionals reflecting on their IPE. In the reflection stage of IPE, pre-professionals may maintain a learning journal or rate their competencies.

In order to incorporate and integrate all the information available according to the research, the following approach to IPE is proposed. In many respects it is similar to the framework proposed by Woods (2007), but has been expanded to incorporate more aspects of best practices in IPE. A transdisciplinarity approach to IPE would allow pre-professionals to understand concepts that permeate both professions without focusing on the origin of the concepts. The transdisciplinarity approach would be enhanced with an anthropological philosophy. The anthropological philosophy conceptualizes collaboration as the two 'tribes' or professions coming together and needing to create a 'shared language' for them to communicate, negotiate out their common goals, and plan for accomplishing the goals (Hall & Weaver, 2001). Pre-professionals would work with individuals from other disciplines on a problem-based case study, in which they would actively engage with the other professions. These problem-based sessions would occur frequently throughout their post-secondary education and would build upon and incorporate discipline-specific knowledge. The IPE sessions will develop many skills, which will equip pre-professionals with the ability to understand and define professional roles, recognize and define of discipline specific terminology, communicate effectively

about team structure and formation, identify a common goal, manage conflicts effectively, and reflect on their collaborative experience.

Reported Evidence of Effectiveness of Interprofessional Education

The evidence supporting interprofessional education in the post-secondary education of pre-professionals is limited, although what was available was published in the past ten years, and did indicate that the inclusion of IPE will benefit students in a variety of ways. Freeth and colleagues (2002, as cited in Wright, Stackhouse, & Wood, 2008) found that the majority of studies available on IPE indicated positive outcomes. These positive outcomes include positive participant perception, changes in attitude, knowledge and skills, changes in behavior in practice, changes in organizational practice, and benefits to clients. In 2008, Reeves and colleagues published an analysis of the research, which indicated the success of IPE in post secondary institutions. It is of interest to note that, before the year 2000, there were no studies on this topic that consisted of randomized control trials. Post-2000, there have been a few studies that have shown positive outcomes for IPE, however these studies lack a rigorous research design and consist of limited and small sample sizes. IPE was shown to be of benefit in health care fields by an improvement of patient satisfaction scores (Brown, 1999, as cited in Reeves et al., 2008) and improved quality of collaborative behaviors (Morey, 2002, as cited in Reeves et al., 2008) when compared to a control group. Young, Chinman, Forquer, Knight, Vogel and Miller (2005) showed that groups who received IPE showed higher scores related to teamwork, holistic approaches, education about care, rehabilitative methods, and overall competency, as measured by the Competency Assessment Instrument (Chinman, Rowe, Young, Forquer, Knight, & Miller, 2003) for health care providers. In summary, Reeves and colleagues (2008) showed that four out of six studies included showed significant positive outcomes with three of those studies reporting a long term effect spanning from eight to twenty-one months. Pre-professionals who participated in a practical experience involving interdisciplinary teamwork showed a significant increase in positive perception towards teamwork as reported through the Interprofessional

Education Perception Scale (Mu et al., 2004). This was even more pronounced in pre-professionals who participated in the training for a longer period of time (Mu et al., 2004). However, Curran, Sharpe, Flynn and Button (2010) found that an extracurricular IPE experience did not result in a long-term significant effect on the attitudes of pre-professionals towards IPE and interprofessional collaboration over a three-year period, despite IPE being positively received. Astin (1993) showed that pre-professionals who enrolled in an interdisciplinary course showed a positive correlation with self-reported growth in knowledge, critical thinking skills, and preparation for graduate or professional school. In that study, researchers believed the volitional enrollment in the interdisciplinary course might negate these findings. In 2004, Kilminster and colleagues refuted this by showing similar outcomes for participants enrolled in compulsory and volitional IPE experiences (as cited in Hammick et al., 2007)

In the twenty-one studies used in the systematic analysis completed by Hammick and colleagues (2007), none reported a negative change in learners' perception of collaboration and interdisciplinary teams. Most outcome measures were based on attitudes towards IPE. Six of the twenty-one attempted to track behavioral changes in individuals who participated in IPE experiences through self-reporting and behavioral observation. There is limited conclusive evidence that IPE actually results in changes in participant behavior, however, Morey and colleagues (2002) determined that nursing students demonstrated an increased confidence in interjecting to explain concepts to patients (as cited in Hammick et al., 2007). In the systematic review, there was some preliminary evidence to show that IPE result in improved screening and illness prevention services, improved practice, decreased morbidity in patients, reduced number of medical errors made, increased volume of patients seen, and increased patient satisfaction scores (Dienst & Byl, 1981, as cited in Hammick et al., 2007; Horbar et al., 2001, as cited in Hammick et al., 2007; Ketola et al., 2000, as cited in Hammick et al., 2007); Morey et al., 2002, as cited in Hammick et.al., 2007; Reeves & Freeth, 2002, as cited in Hammick et al., 2007).

A study completed in 2005 examined IPE from a cognitive perspective and found cognitive benefits to pre-professionals participating in IPE (Nikitina, 2005). There are three advanced cognitive activities required for IPE. The first is described as "overcoming monologic thinking" (Nikitina, 2005, p. 369), which requires pre-professionals to move from a single perspective of one discipline to a perspective that integrates and synthesizes using multiple disciplines. IPE requires pre-professionals to achieve a state of provisional integration, which is melding of disciplinary views to ease tension. Pre-professionals accomplish this through complexification or the expansion of their own discipline to accommodate and address issues that are beyond traditional scope and respond to challenges presented by other disciplines. Finally, pre-professionals must determine their philosophical views regarding the necessity of collaboration. This study provided information regarding the complex cognitive skills that can be developed through interprofessional education, and can easily be embedded in the curriculum and process of IPE (Nikitina, 2005).

Reports related to the efficacy of interprofessional education between the disciplines of speech-language pathology and education is limited. One study brought together forty undergraduate pre-professionals from the disciplines of education and speech-language pathology (Martino, 2003). This study used pre-tests/post-tests, surveys, and teaching community activities to detect learning in the pre-professionals. Gains were shown on the pre-test/post-test for more than half the pre-professionals. After the IPE initiative, the surveys indicated pre-professionals gave simplified responses to questions such as "what do you think the role of the speech-language pathologist is in the school system?" when compared to professionals in their fields.

While limited, there is some evidence supporting the effectiveness of interprofessional collaboration. IPE has shown positive effects on preparation of pre-professionals through teaching skills essential to collaboration and exposing pre-professionals to

other disciplines they will collaborate with in the future. However, rigorous study of IPE is still missing from the literature.

Implications and Future Directions for Research in the Area of Interprofessional Collaboration and Education

As evidenced, the research conducted in the area of interprofessional collaboration and interprofessional education is extremely limited and explorative, although it is an area of high interest due to the recent trends in many professions to include teamwork and collaboration across disciplines. In 1999, Zwarenstein, Atkins, Barr, Hammick, Koppel, and Reeves reported that there was no quantitative evidence of the benefit or ineffectiveness of interprofessional education. In 2008, Reeves and colleagues reported on six studies that quantitatively and objectively measured the effects of interprofessional education. The most crucial points of concern in reviews seems to be the lack of empirical research to determine whether or not the goals of collaboration are being met, and whether negative effects, such as negative attitudes and perceptions, exist and persist (Zwarenstein et al., 1999). Research in this area is generally qualitative and reflective in nature and there is a general lack of rigorous research designs involving large samples of the population (Reeves & Lewin, 2004). Some studies have used the criterion of accomplishment of goals as a determinant of success of interaction (Patel et al., 2000) while others look at a more ethnographic approach examining reflections of participants and observations of interactions as indicative of success (Mu et al., 2004; Reeves et al., 2008; Munoz & Jeris, 2005; Reeves & Lewin, 2004; Zwarenstein et al*.,* 1999). Often reflections are guided by questionnaires that are frequently semi-structured (Lingard, Espin, Evans & Hawryluck, 2004). A few studies used the iterative grounded system of analysis when looking at dialogue and interviews whereby transcripts are coded and emerging themes are sought and honed (2004Lingard et al., 2004; Reeves et al., 2004; Willumsen & Hallberg, 2003). Another approach is to use action research, which begins with a dilemma and looks at change throughout the process and not just upon completion (Munoz & Jeris, 2005). A different

type of study examined improvement of attitudes towards interdisciplinary collaboration using a Likert scale and pre and post-tests, with significant improvement in attitudes to interdisciplinary teamwork (Mu et al., 2004). A major criticism of all studies that examine collaborative education is that they fail to take into account the effect of professional and organizational contexts and the environment that will impact behaviors (Boaden & Leaviss, 2000).

Thannhauser, Russell-Mayhew and Scott (2010) conclude that a quantitative instrument to measure the effectiveness of collaboration is still to be developed as instruments of this sort are often created for specific interactions between certain disciplines. Without a quantitative measure that is robust and reliable, measuring the effects of collaboration will continue to be challenging.

Conclusions of Literature Review

Speech-language pathologists and teachers work with students in the domain of language and literacy. With the push for integration and inclusion in the school system, speech-language pathologists and teachers are now faced with the challenge of working together to provide the highest quality of education to students with exceptional needs. As collaboration is the focus of new restructured educational service delivery models, it seems fitting that pre-professionals in undergraduate and graduate programs experience collaboration prior to graduation in the form of interprofessional education (IPE). IPE is effective when it provides pre-professionals with multiple problem-based learning situations throughout their education. IPE should equip pre-professionals with collaborative skills that will enhance the effectiveness of their ability to work with other professionals. While research is just emerging, there is a positive case being made for the efficacy of IPE.

Purpose of Research Project

The purpose of this study was to provide post-secondary pre-professionals in the disciplines of education and speech-language pathology with an IPE experience and determine the effects of that experience. The IPE experience was structured to promote interaction and critical thinking as pre-professionals attended an interactive seminar, completed a collaborative case study with pre-professionals from another discipline and reflected on their knowledge and skills. Through IPE, this project provided insight into strategies for preparing SLP and education pre-professionals to collaborate in the education system after graduation and encourage quality and informed interactions between these professionals in their careers. This study examined IPE from four key constructs of collaboration.

Key Constructs of Collaboration

Personal reflections related to self-evaluation of collaborative competencies. Collaborative skills such as handling conflict, working together, and attitude toward collaboration have been identified as important to a successful collaborative interaction (Barr, 1998, as cited in Freeth & Reeves, 2004; Engel, 1994, as cited in Freeth & Reeves, 2004; Hornby, 2000, as cited in Freeth & Reeves, 2004; Hall & Weaver, 2001; Woods, 2007). Reflection is an effective teaching approach to interprofessional collaboration education that fosters the development of individual skills (Mu et al., 2004). This study examined the reflections of participants to determine perceived changes in knowledge and skills related to collaboration.

Knowledge and ability to outline/understand professional roles. Many researchers have identified that, in interprofessional collaboration, participants must be able to describe their own role as well as respect the roles of others (Barr, 1998, as cited in Freeth & Reeves, 2004; Engel, 1994, as cited in Freeth & Reeves, 2004; Hornby, 2000, as cited in Freeth & Reeves, 2004; Hall & Weaver, 2001; Woods, 2007). Participants reflected upon their own and other professions' roles and responsibilities and then

applied this knowledge to authentic situations. The study looked for changes in perceptions of own and other professionals' roles as a result of the IPE experience.

Communication skills, specifically the ability to identify and reduce discipline-specific terminology. Collaboration is primarily built around communication, and linguistic competence is identified as a primary component of collaboration (Becherr & Trowel, 2001, as cited in Woods, 2007). Discipline-specific vocabulary is often identified as a barrier in collaboration, as terms are often specialized and inaccessible to those outside the discipline (Hall & Weaver, 2001; Woods, 2007). This study examined participants' ability to identify discipline-specific terminology and minimize such terminology use in authentic written explanations of concepts.

Knowledge and understanding of models of specialized service delivery in schools. Understanding how roles and responsibilities can be implemented in the school system is important for pre-professionals. This knowledge assists in matching service delivery to student needs (Flynn, 2010). This study examined participants' responses in practical and authentic application tasks to determine awareness of multiple models of specialized service delivery and collaboration.

Research Question

This study was designed to answer the following research question:

> *What are the effects of an interprofessional education experience on pre-professional speech-language pathologists and teachers in the following key constructs of collaboration:*
>
> - *Reflection and self-evaluation of collaborative competencies*
> - *Knowledge and ability to outline/understand professional roles*
> - *Communication skills, specifically the ability to identify and reduce discipline-specific terminology*

- *Knowledge and understanding of models of specialized service delivery in schools*

Methods

Participants

Participants were students enrolled in either the Faculty of Education or the Faculty of Rehabilitation Medicine in the Department of Speech Pathology and Audiology at the University of Alberta. Undergraduate pre-professionals were registered in the Faculty of Education course entitled 'Language Arts in Elementary Schools'. This course was designed to prepare pre-professionals to implement a Language Arts curriculum in an elementary school setting. The graduate pre-professionals were registered in the Department of Speech Pathology and Audiology course entitled 'Language and Literacy', which focuses on the relationship between oral language and literacy skills such as reading and writing. All pre-professionals enrolled in the course, 'Language Arts in Elementary Schools' and the course 'Language and Literacy' took part in the interprofessional education (IPE) experience. All pre-professionals in the IPE experience were invited to become participants in this research study. To avoid confusion, 'pre-professionals' will refer to all students who were involved in the IPE experience. 'Participants' will refer to those pre-professionals who gave informed consent to participate in the research project. There were no exclusion criteria for this study.

Fifty-five pre-professional speech-language pathologist students and fifty-two pre-professional teachers participated in this study. Overall, 95% of pre-professionals who took part in the IPE experience gave consent to participate in this study (98% of SLP pre-professionals, 91% of education pre-professionals). Over ninety percent of the participants were females with 1 male participant from the SLP discipline and 6 male participants from the education discipline. Participants were between 20 and 40 years of age. Education participants had minor specializations in areas of early childhood education, special education, educational psychology, language and literacy, math,

science, physical education, social studies, French and Chinese. SLP participants all had a minor specialization in audiology. SLP participants indicated they had been in a post-secondary institution for 5 to 8 years, while education participants indicated being in a post-secondary institution for 2 to 11 years. All SLP participants had been awarded a bachelor's degree in arts, science or education. Only three education students had received a bachelor's degree in another discipline. Eight SLP participants had a been awarded a bachelor's degree in education, and fifteen education participants indicated an interest in speech-language pathology with three of them having taken one linguistics course. Participants in the Department of Speech Pathology and Audiology holding a bachelor's of education and students in the Faculty of Education who were interested in pursuing studies in speech-language pathology and had completed at least one introductory linguistics course were identified. However, for this project, this cohort was analyzed as a part of the collectivity of participants, and not as a distinct subset.

For pre-professional speech-language pathologists, the IPE experience took place midway through their second semester in a two-year course of study. For pre-professional teachers, the timing of the IPE experience varied and depended on when the pre-professional opted to take the course in which the IPE experience was offered. SLP participants did not have any practicum experience in speech-language pathology, while over ninety-five percent of education participants had completed a five-week introductory practicum placement in a classroom. While the actual delivery time of the IPE experience was variable, pre-professionals from both disciplines likely had some knowledge of collaboration, as they were exposed to it in other areas throughout their program of study. Pre-professional speech-language pathologists completed two collaborative interprofessional experiences with other health science disciplines, and some pre-professional teachers may have taken a course entitled "Consultation and Collaboration in Education". Collaboration is a common theme that likely had arisen in another course for pre-professional teachers. Freeth and Reeves (2004) concluded that

by exposing pre-professionals to collaboration at a variety of times throughout their program, maximum benefit was achieved, as pre-professionals were not thoroughly immersed in their own discipline culture (Freeth & Reeves, 2004; Hall & Weaver, 2001), yet they were able to use their discipline-specific knowledge in a higher order and critical fashion (Hall & Weaver, 2001; Spelt et al., 2009; Woods, 2007).

Materials

Reflective survey. The reflective survey (Appendices A-1 and A-2) provided an opportunity for pre-professionals to reflect on their knowledge and skills in general interprofessional collaboration and specific collaboration between speech-language pathologists and teachers. Two versions of this survey were developed to guide reflections before and after the IPE experience. The survey completed before the IPE experience contained all items that were analyzed, and the survey completed after the IPE experience omitted some of the items that did not need to be analyzed a second time. The surveys consisted of open-ended and closed questions. The pre-IPE and post-IPE surveys were piloted with pre-professionals and new graduates in both disciplines. Responses were examined for their appropriateness relevant to outcome measures. After the pilot, the survey was shortened and some questions were reworded for increased clarity. The post-IPE survey paralleled the pre-IPE survey but also included reflections and feedback on the overall IPE experience. Questions on the pre- and post-IPE surveys provided data on skills related to key constructs as outlined below:

Personal reflection related to self-evaluation of collaborative competencies. Information was gathered using self-ranking in the following areas:

- confidence in their knowledge of the referral process (Appendix A-1, item 14)
- confidence in general collaborative skills (Appendix A-1, items 15),
- confidence in communicative competencies (Appendix A-1, items 16-18),
- confidence in conflict management skills (Appendix A-1, item 19) and,

- descriptions of personal strengths and areas for improvement in collaboration (Appendix A-1, items 20-21).

Outlining and understanding professional roles & responsibilities. Information was gathered through:

- descriptions of roles in short answer questions (Appendix A-1, items 1-4), and
- identification of responsibilities of each discipline from a list that includes responsibilities that are specific to each discipline and ambiguous responsibilities that can be part of both disciplines (Appendix A-1, items 5-6).

Communication: identification, definition, and reduction of discipline-specific terms. Information was gathered through:

- categorization of pre-professionals' own familiarity with identified discipline-specific terminology from both SLP and education disciplines (Appendix A-1, item 7),
- categorization of discipline-specific terminology as being known by either or both professions (Appendix A-1, item 8), and
- explanation of concepts to parents, in a manner that should not include discipline-specific terminology (Appendix A-1, items 9-10).

Models of specialized service delivery in schools. Information was gathered through:

- description of the different ways in which speech-language services can be structured in schools (Appendix A-1, item 11), and
- critical examination of service delivery models by providing strengths and limitations of collaboration and consultation (Appendix A-1, items 12-13)

Interactive seminar. An interactive interprofessional education seminar was designed by the researcher and was approved by course professors (Appendix B-1). Participants were provided with a work-book to guide their learning through the

Interactive Seminar (Appendix B-2). The seminar content emphasized the key constructs targeted in this project:

Outlining and understanding professional roles & responsibilities. To highlight professional roles, pre-professionals:

- described their professional role to members of the other discipline, and
- described what professional knowledge and skills each discipline brings to interdisciplinary teams.

Pre-professionals discussed the population of students that could benefit from the services of a speech-language pathologist and teacher team through the creation of a ranked list of students based on learning and behavioral characteristics, to determine the students who will receive limited speech and language services.

Communication: identification, definition, and reduction of discipline-specific terms. Pre-professionals identified and explained discipline-specific terms to other professionals through:

- conversations with the other discipline on a metaphorical 'tour' of their profession and deciding which metaphorical 'landmarks' or discipline-specific terms need to be shown and explained, and
- provision of immediate peer-feedback on the quality of team members' explanations.

Models of specialized service delivery in schools. A metaphor that involved an island (i.e., speech-language pathologists) and the mainland (i.e., the schools) was developed to make this perspective salient to pre-professionals. Pre-professionals discussed the implications of the inclusion movement for service delivery models that provide speech and language services in schools through:

- discussion of the following models:

- consultative model (Hartas, 2004),
- pull-out model (Paul, 2007; Hartas, 2004), and
- classroom-based model (Diehl, 2003)
- Collaborative models (Hall & Weaver, 2001)
  - Multidisciplinary
  - Interdisciplinary
  - Transdisciplinary, and

- critical examination of strengths and weaknesses of the different consultative and collaborative models (multidisciplinary, interdisciplinary, transdisciplinary).

Pre-professionals explored the various ways a speech-language pathologist and teacher could interact and the possible roles a speech-language pathologist can play within a school through discussion and brainstorming to generate different modes of interaction. For example, intervention and prevention (Prelock, 2000) and co-teaching arrangements such as 'one teach, one observe' (Flynn, 2010) were explored.

Collaborative case study. Pre-professionals were given a classroom case study as a constructivist and problem-based learning context. The case study included the following information (Appendix C):

- number of students in the classroom,
- description of students with exceptional needs and interesting traits (some with speech, language and/or communication concerns),
- description of the school and classroom environment,
- time allotted for speech-language pathologist to be available, and
- available personnel such as parent volunteers, educational assistants, resource or special education teachers, etc.

The student descriptions in the case study included children with complex needs that required contributions of both professionals, which set up an ideal context for collaboration (Bronstein, 2003). For example, a student with social interaction skill deficits was described in the case study. Social skill development is an area where speech-language pathologists and teachers are both able to contribute their knowledge and skills and is an area of development that both professions target with students (Miller, 1999). Another student description included language learning difficulties to encourage discussion of the link between oral language, the domain of speech language pathologists, and formalized reading and writing, and the domain of both teachers and speech-language pathologists (Ukrainetz & Fresquez, 2003).

The collaborative case study required pre-professionals to work together to create a plan for intervention. Teams were provided with a structured outline that asked them to: (Appendix C)

1. identify the needs of the students that could benefit from direct services from a speech-language pathologist,
2. identify what type of intervention would assist in alleviating the needs,
3. determine who will be responsible for developing and implementing the intervention (the role(s) of the professionals and personnel in the classroom),
4. determine how the intervention will be administered
    a. consultative or collaborative (multidisciplinary, interdisciplinary or transdisciplinary),
    b. pull-out or classroom-based,
    c. large-group or small-group, and
5. prepare for a meeting with the parents of a student to explain their plan and the rationale behind their plan

Procedures

Recruitment of participants. Pre-professionals from all participating courses received an introduction to the interprofessional education experience near the beginning of the course from the researcher. The researcher explained to pre-professionals that students from the disciplines of speech-language pathology and education were going to join together for an IPE experience. The researcher provided a brief outline of the IPE experience and described the interactive seminar, the reflective surveys, and the collaborative case study. The researcher explained that all pre-professionals in these courses were going to complete the IPE experience; however, they had the option to give informed consent for their responses from the reflective surveys and the collaborative case study to be used for research to determine the efficacy of the IPE experience. All enrolled pre-professionals were provided with a form for informed consent and a form that gathered their demographic information. A box for all consent forms, whether signed or not, was left in the room, and the researcher collected all forms within a few hours.

Surveys and seminar. Before the pre-professionals arrived on the day of the first 2-hour block of the IPE experience, they had completed the first reflective survey in an on-line format. Participants were logged in to complete the survey for 15 minutes to 1 ½ hours according to automatically recorded log-in and out times. They may, or may not, have spent the entire log-in time working on the survey. After completion of the survey, all pre-professionals were provided with three assigned readings pertaining to team formation (Oregon, 2010), conflict management (McCorkle, 2002), and models of speech and language service delivery (Flynn, 2010). These are three important constructs of collaboration that were not discussed in the interactive seminar due to time constraints.

Due to the large number of pre-professionals taking part in the IPE experience, two sessions of the interactive seminar and collaborative case study were held. Pre-

professionals were randomly assigned to the session they attended. Approximately fifty individuals attended each session. Both sessions had an almost equal distribution of pre-professionals from both disciplines. Materials, the instructor and the information presented were the same across sessions.

In the first ninety-minute class block pre-professionals came together to participate in the interactive seminar. They had the opportunity to interact and problem solve with members of both disciplines in a structured setting. In the second ninety-minute class block, pre-professionals from all participating classes were divided into small heterogeneous groups of four to six pre-professionals that had representatives from both disciplines. The small groups worked through the collaborative case study and handed in a final product at the end of the class. During the collaborative case study, groups were set up so that participants were grouped together and non-participants were grouped together.

After completion of the two class blocks dedicated to the IPE experience, pre-professionals completed the post-reflective survey online.

Ensuring participant privacy (ethics). The project received approval from the University of Alberta Health Research Ethics Board (HREB) in January 2011. Informed consent forms and information sheets were distributed and collected from participants (Appendix D) to all participants. The study followed all outlined guidelines that were approved by HREB.

Outcome Measures

The project looked at the efficacy of a single exposure to interprofessional education for education and speech-language pathology students. The effects of IPE were shown through qualitative and quantitative analysis of participant responses pertaining to four main constructs of interprofessional collaboration:

- *Reflection and self-evaluation of collaborative competencies*
- *Knowledge and ability to outline/understand professional roles*
- *Communication skills, specifically the ability to identify and reduce discipline-specific terminology*
- *Knowledge and understanding of models of specialized service delivery in schools*

Method of Analysis

Research design. This study used a mixed methods design. The study addressed the research question by identifying and analyzing patterns that emerged from responses from the participants. The constructs of collaboration can be thought of as 'target variables' that had the potential to be examined at three points in time: before, during and after the IPE experience. Responses from the reflective surveys were sorted by the independent variables of pre-professional discipline (two levels: speech-language pathology and education) and interprofessional education (two levels: before and after the IPE experience). The collaborative case study provided insight into knowledge and skills in construct areas during the IPE experience. The dependent variables for the reflective surveys and collaborative case studies were results in the four key constructs of interprofessional collaboration: personal reflection, professional roles, communication skills, and knowledge of models of service delivery. The study yielded both qualitative and quantitative measures related to each of the target variables.

Qualitative analysis.

Theoretical overview of qualitative analysis method. The analysis process for open ended responses applied several principles of descriptive analysis. First, the analysis method sought to be low-inference (Sandelowski, 2000); where two researchers agreed that the reported trends did indeed exist. The summative analysis method strived to present the facts that existed using terminology that was directly used by the participants (Sandelowski, 2000). Finally, the analysis method attempted to

balance encompassing the entire body of data, or fullness of the description, and pulling forward an emerging trend from the responses for discussion.

Inductive (summative) and deductive (directed) content analysis methods were used to analyze the open-ended responses from the reflective surveys. Two researchers reviewed structured responses, researchers identified recurring concepts within responses (Hsieh & Shannon, 2005) and trustworthiness measures were conducted. Wherever possible, researchers transformed qualitative responses into numerical frequencies to aide in the exploration of concept usage by participants (Creswell & Clark, 2008; Hsieh & Shannon, 1993; Morgan, 1993). This method allowed researchers to explore and compare usage between the independent variables of discipline and IPE experience (Hsieh & Shannon, 2007). Additional details of the qualitative procedures are outlined in the next section.

Qualitative analysis procedure

Reading. The analysis process began with two researchers immersing themselves in the responses provided in the pre-IPE reflective survey. One researcher was the principle investigator in this study, a graduate student in speech-language pathology with a Bachelor of Education degree with a minor in special education. This researcher spent approximately seven months in the school system as a student teacher and worked as a therapy and recreation aide for children with special needs for five years and as an inclusion program facilitator for children with special needs for two years. The second researcher is an associate professor in the Department of Speech Pathology and Audiology and has been a speech-language pathologist for 28 years. The researchers read through all the responses provided to the set of questions being analyzed. During this initial reading, the researchers reflected on emerging themes and potential codes that would capture the responses that were observed. Reading the responses was followed by a period of waiting of at least two or three hours to no more than a day. This period of waiting allowed the researchers a chance to reflect on the

responses without assigning any formal labels. The waiting period also allowed researchers to construct their own understanding of the data, taking into consideration their own reality, knowledge, and understanding (Mills, Bonner & Francis, 2006).

Coding. Coding is the "process of attaching labels to the lines of text so that the researcher can group and compare similar or related pieces of information" (Ulin, Robinson & Tolley, 2005, p. 142). This study used two approaches to developing and applying codes to the responses: summative content analysis and directed content analysis.

Summative content analysis. In order to ensure that the inductively derived codes were valid and accurately represented the responses, two researchers initially sorted through the responses to specific questions and developed their own coding outline. The coding outline consisted of a label for the code, a description of the code, and an example of a response taken directly from the transcript that would be classified by the code (Ulin, Robinson & Tolley, 2005). When developing a coding outline, both researchers tended to label the code with a few words that appeared in at least one transcript and could easily be inferred to have a similar meaning to other terms used by participants, thus operationally defining each code. Next, researchers came together to compare and contrast their coding outlines for responses. Together, the researchers combined their coding outlines to make a universal coding structure. The coding structure could have up to three levels of specificity; content categories, codes, and sub-codes. The content categories were categories for grouping and organizing related codes, the codes were the general codes that were developed by the researchers initially, and the sub-codes added more detail to the codes to encapsulate the variety of responses. Confirmability was the primary driving force behind steps taken to establish a valid coding system.

Directed content analysis. Directed content analysis differs from summative content analysis in that the codes are derived from pre-existing literature, rather than from the transcripts. This approach extends and applies an existing

theoretical framework to the transcripts by creating the coding structure before the analysis begins (Hsieh & Shannon, 2005). The process is essentially a deductive process (Mayring, 2000). The researchers derived the codes for specific questions from the seminar content regarding models of speech and language service delivery in schools and the Health Sciences Education and Research Commons interprofessional learning pathway competency framework (HSERC, 2011). All codes had operational definitions, which were derived from the literature (Hsieh & Shannon, 2005; Potter & Levine-Donnerstein, 1999). In a deductive manner, the researchers used the literature based coding structure to code the responses from the participants (Mayring, 2000; Potter & Levine – Donnerstein, 1999).

Re-coding for trustworthiness. Using the jointly developed coding structures, the primary researcher re-coded every participant's response for the relevant items. The second researcher re-coded 20% of the transcript and a trustworthiness measure was conducted. In the re-coding process, both researchers noted any responses that were out of the ordinary and any modifications to the coding structure they felt would be necessary to completely encapsulate the responses. Saturation was established by allowing the coding structure to be flexible and expand to incorporate all responses (Maxwell & Satake, 2006). The trustworthiness measure was determined by dividing the number of identical codes per response by the highest number of codes the researchers indicated was required to adequately code the response. For example, on a given response researcher A had three codes and researcher B had two codes. Both codes used by researcher B appeared in the codes used by researcher A so the trustworthiness measure for that response would be 2/3. If it could be determined that the researchers were coding the same phenomena but disagreeing on how to use the coding structure, the trustworthiness measure was adjusted to account for this. In most cases, a unanimous decision to collapse two or more codes was applied so that multiple codes that could be used to imply a single phenomena without lowering the trustworthiness measure. The researchers aimed for an average of 80%

trustworthiness. This indicated that the researchers agreed on coding for at least 80% of the phenomena coded. When inter-rater reliability dropped below 80%, the two researchers met and discussed 10-20 responses. They worked together to align their understanding and use of the coding structure and then both researchers re-coded with the new calibration. Trustworthiness measures were completed again after the re-coding. This process continued until an average 80% reliability was achieved. If 80% trustworthiness was difficult to achieve, the researchers, on occasion, coded an entire set of data together.

Quantitize the qualitative codes. Researchers quantitized data through establishment of frequencies of concepts organized by dependent and independent variables (Chang, Voils, Sandelowski, Hasselblad & Crandell, 2009). Codes were recorded and separated first by construct or dependent variable (i.e. professional role of an speech-language pathologist, professional role of teacher), then by independent variables of discipline (i.e. education and speech-language pathology students) and time (i.e. pre-IPE experience and post-IPE experience), leading to four distinct groups (i.e. education-pre, education-post, speech-language pathologist-pre, speech-language pathologist-post) for each construct. This enhanced the accuracy of the description as results were reported in a numerical fashion (Thomas, 2003). As the concepts and categories whose frequencies were reported were initially derived directly from the responses, the researchers did not attempt to derive underlying meaning of the words and content, as would be done in 'latent content analysis' (Babbie, 1992, as cited in Hsieh & Shannon, 2007; Catanzaro, 1988, as cited in Hsieh & Shannon, 2007; Morse & Field, 1995, as cited in Hsieh & Shannon, 2007). Instead, researchers were able to report frequency with which each category was used and provide descriptions and examples of how the questions were answered (Chang, Voils, Sandelowski, Hasselblad & Crandell, 2009).

Quantitative analysis.

Descriptive statistics. Whenever possible, analysis of responses included descriptive statistics such as percentage or frequency of responses, mean, and standard deviation.

Word count analysis. Participant responses that asked participants to explain concepts in language that would be accessible to individuals outside their professions used a word count analysis process. The analysis process involved the counting of the number of discipline-specific (jargon) words in the explanation provided by the participant. This type of response was found both on the reflective survey and on the collaborative case study. Researchers first developed objective criteria to identify jargon words (refer to Appendix E to see the full list of objective criteria selected). The researchers went through over one hundred responses and created a list of words used by participants that met the criteria of being discipline-specific terminology. After the list of jargon words was agreed upon, one researcher went through all participant responses and recorded the number of jargon words each participant used when responding to the question. While going through the responses, the researcher also identified any additional words that could be identified as jargon. These additional words were discussed with the second researcher and the two researchers concluded whether the word was, or was not, jargon before they included the word as discipline-specific terminology. Researchers also counted the number of times a participant explained a jargon term appropriately, as judged by the researchers. The word count analysis resulted in the number of jargon terms used by each participant and the number of terms that were defined.

Repeated measures test. A two way-analysis of variance (ANOVA) with repeated measures was used to analyze two response items of the study. ANOVA was used to analyze the changes in personal reflections and use of discipline-specific terminology. The ANOVA compared the independent variables of pre-professional discipline (two

levels: speech-language pathology and education) and interprofessional education (two levels: before and after the IPE experience). Analysis of Variance (ANOVA) is a statistical procedure that is applicable to sets of data that involve two or more independent variables (Brace, Kemp & Snelgar, 2000). ANOVA allows researchers to compare two independent variables in a single test therefore reducing the need to correct for error (Brace, Kemp & Snelgar, 2000). The data in this study was not always normally distributed and the population variances were not always equal, however the ANOVA analysis is robust to deviations from normality and can provide accurate estimates of the analyzed variables (Plichta & Garzon, 2009). If the data showed a significant between-group difference before IPE experience, researchers adjusted for the confounding baseline difference by performing a regression analysis. This was done to determine whether the between group difference after the IPE experience was due to the differences apparent before the IPE experience or as a result of the treatment effect. The program, SPSS (Statistical Package for the Social Sciences), was used to conduct this analysis and it automatically adjusted for Type I error through the use of the Bonferroni correction where alpha was divided by the number of pairwise comparisons made within a data set (i.e., 0.05 was divided by number of comparisons for the same data points in that particular analysis) (Davies, 2010).

Where appropriate, the researchers also used a pair-wise comparison in a post-hoc analysis to interpret findings from the ANOVA analysis. For this, researchers used independent t-tests which compared the means of two of the two disciplines on the variable of interest (Brace, Kemp & Snelgar, 2000).

Application of analysis methodology

***Response items and constructs*.** This study had two main data sources: the reflective surveys and the collaborative case studies. There were multiple measures for each of the dependent variables from these two sources. Multiple responses related to

the construct were obtained to ensure consistency of findings (Maxwell & Satake, 2006). The data sources organized by construct are summarized in Table 1 and analysis methods are detailed in the next section (Table 2 through Table 5).

Table 1

Summary of data sources organized by collaborative construct

Construct	**Data Source(s)**	
	Reflective Survey	Case Study
Personal Reflections	✓	
Knowledge of Professional Roles	✓	✓
Communication Skills	✓	✓
Knowledge of Models of Service Delivery	✓	✓

Response items and analysis methods for constructs. Tables 2 through 5 show a summary of response items for each of the constructs from the surveys and case studies and the analysis process that was used to analyze each of them. Item numbers refer to the pre-IPE reflective survey (Appendix A-1).

Table 2

Reflections & self-evaluation: Summary of response items and analyses methods

Description of Response Item	**Item Number on Pre-Survey**	**Qualitative**		**Quantitative**	
		Summative Content Analysis	Directed Content Analysis	Descriptive Statistics	Repeated Measures ANOVA
Open ended question from reflective survey evaluating personal strengths and weaknesses in collaboration	20 - 21		HSERC Competency Framework		
Likert scale ranking from reflective survey evaluating self-ratings of collaborative competencies	14 - 19				✓

Notes: ANOVA = Analysis of Variance. HSERC = Health Sciences Education and Research Commons (HSERC, 2011).

Table 3

Knowledge of professional roles: Summary of response items and analysis methods

Description of Response Item	Item Number on Pre-Survey	Qualitative		Quantitative	
		Summative Content Analysis	Directed Content Analysis	Descriptive Statistics	Repeated Measures ANOVA
Open ended question from reflective survey examining descriptions of each disciplines professional roles	1 - 4	✓			
Application of professional roles from case study description of roles and responsibilities of professionals	N/A		Applied summative coding structure developed for the item above (reflective survey)		
Likert scale ranking from reflective survey evaluating self-ratings of knowledge of when to make referrals	14				✓

Notes: ANOVA = Analysis of Variance

Table 4

Communication Skills (discipline-specific terminology): Summary of response items and analysis methods

Description of Response Item	Item Number on Pre-Survey	Qualitative		Quantitative	
		Summative Content Analysis	Directed Content Analysis	Descriptive Statistics	Repeated Measures ANOVA
Open ended questions from reflective survey examining explanation of discipline-specific concepts to individuals outside of own discipline (i.e., parents)	9 – 10				✓
Open ended question from collaborative case study examining explanation of service delivery plan to individuals outside of both disciplines (i.e., parents)	N/A			✓	
Categorical ranking from reflective survey on awareness of discipline-specific terms in isolation	7 - 8			✓	
Likert scale ranking from reflective survey evaluating self-ratings of skills in clear and concise communication and identifying/defining jargon terms	17 – 18				✓

Note: ANOVA = Analysis of Variance

Table 5

Knowledge of models of specialized service delivery: Summary of response Items and analysis methods

Description of Response Item	Item Number on Pre-Survey	Qualitative		Quantitative	
		Summative Content Analysis	Directed Content Analysis	Descriptive Statistics	Repeated Measures ANOVA
Open ended question from reflective survey examining application of models of service delivery	11		Adapted from Flynn (2010), Hall & Weaver (2001), Minore & Boone (2002)		
Application of service delivery models from case study	N/A		Adapted from Flynn (2010), Hall & Weaver (2001), Minore & Boone (2002)		
Open ended questions from reflective surveys examining strengths and weaknesses of consultation and collaboration.	12 - 13	✓			

Notes: ANOVA = Analysis of Variance

Results

To report the results of this study, the following section is organized by the four collaborative constructs that were examined:

- Reflection and self-evaluation of collaborative competencies
- Knowledge and ability to outline/understand professional roles
- Communication skills, specifically the ability to identify and reduce discipline-specific terminology
- Knowledge and understanding of models of specialized service delivery in schools

Within each construct, two to four response items were analyzed and the results from each response item are reported accordingly.

Construct 1: Reflection and self-evaluation of collaborative competencies

Response item 1: personal strengths and weaknesses in collaboration (open-ended question from reflective survey).

Summary of directed content analysis (collaborative competency coding structure). Each participant was asked to list three personal strengths and three weaknesses related to collaborative competencies. The coding structure used to analyze responses of personal strengths and weaknesses was derived from the University of Alberta Health Sciences Education and Research Commons Interprofessional Learning Pathway Competency Framework (HSERC, 2011). The framework, and subsequently the coding structure (Appendix F), consisted of four competencies of collaboration: Communication, Collaboration, Role Clarification, and Reflection. The Communication code was defined as 'communication skills that enhance interprofessional team function' (HSERC, 2011, p.3). Communication included references to written or verbal communication, listening and understanding, assertiveness and asking for clarification, conflict management, and using clear and concise communication. Participant responses included discipline-specific terminology, such as when a participant stated, "Being able to better define discipline-specific words, and being aware of which words other professional may think they know (but who may use the term differently from speech-language pathologists." (SLP 116 – post-IPE reflective survey). The Collaboration code was defined as "interprofessional team process skills that achieve common goals" (HSERC, 2011, p. 3). Collaboration included references to participation, encouraging others to participate, skills in decision-making, flexibility and open-mindedness, respect, patience with other team members, and personality factors such as friendliness. Participant responses such as "…open to new ideas from others" (Education participant, 223 – post-IPE reflective survey) indicated open-mindedness and therefore were coded as Collaboration. Role Clarification was defined as "understanding of own role and the roles of others in an interprofessional context" (HSERC, 2011, p. 4). The code of Role Clarification included references to understanding your own and other professional roles, advocating for professionals and

clients, providing specialized knowledge, taking the perspectives of other professionals, and applying roles within the team such as leadership roles. A participant response that stated, "…not afraid to take a leadership role once I have become comfortable with my group members" (Education participant, 312 – post-IPE reflective survey) or a participant response that stated, "I think having more practice as well as having a better understanding of everyone's roles will make it easier." (SLP participant, 149, pre-IPE reflective survey) was coded as Role Clarification. The Reflection code was defined as "critical evaluation of professional and team practice in an interprofessional context' (HSERC, 2011, p.4) and included references to skills in the area of reflection or the enjoyment of reflection. Participant responses such as "I like to look ahead and into the future – the big picture." (SLP participant, 114 pre-IPE reflective survey) and "I would also like to recognize my own strengths." (SLP participant, 140 – pre-IPE reflective survey) were coded as Reflection. Table 6 includes the percentage of participants who included each competency as one of their three strengths or weaknesses before and after the IPE experience. The proportion of the participant population that mentioned the code was reported (i.e., number of participants who mentioned the code divided by total number of participants).

Table 6

Frequency of participant responses referring to collaborative competencies as strengths and weaknesses

Competency	Participant Discipline	Pre IPE Strength	Post IPE Strength	Pre IPE Weakness	Post IPE Weakness
Collaboration	**SLP**	84%	86%	25%	24%
	Education	89%	81%	32%	26%
Communication	**SLP**	80%	74%	53%	57%
	Education	71%	69%	41%	39%
Roles	**SLP**	26%	26%	55%	36%
	Education	16%	14%	24%	26%
Reflection	**SLP**	2%	2%	4%	0%
	Education	2%	0%	0%	0%

Notes: IPE= interprofessional education. SLP = speech-language pathology.

The frequency with which specific strengths were identified by participants before the IPE experience was similar to the frequency with which participants reported strengths after the IPE experience. The only notable result was the SLP identification of Role Clarification as a weakness. Before the IPE experience, SLP participants commonly identified Role Clarification as a weakness (55%), while after the IPE experience SLP participants less frequently identified Role Clarification as a weakness (36%).

Participants from both disciplines regularly identified their strengths to be in the areas of Communication and Collaboration before and after the IPE experience. Interestingly, both SLP and education participants also commonly identified aspects of Communication as an area of weakness. SLP participants identified Role Clarification as an area of weakness before the IPE experience. After the IPE experience, both groups of participants identified Role Clarification as a weakness infrequently.

Response item 2: self ratings of collaborative competencies (Likert scale ranking from reflective survey). Participants were asked to use self-reflection to rank their agreement with six statements on a five-point scale with responses 'strongly disagree' (1), to 'strongly agree' (5). Some statements related to the key constructs of collaboration, while others were general questions related to collaborative competencies. The six questions and the constructs represented by each are included in Table 7.

Table 7

Summary of reflective statements related to constructs of collaboration

Construct	**Reflective Statements**
Knowledge of Professional Roles	I know how and when to involve other professionals in providing services to school-aged children with exceptional concerns
Communication Skills	I am a clear and concise communicator when I am working on professional teams
	I am able to *identify* discipline-specific terms, that would not be known by people outside my discipline
	I am able to *define* discipline-specific terms for parents in a way they will understand
Other	I possess all collaborative skills needed to work on a team with other professionals
	I am able to work through conflicts effectively in a team environment

Repeated measures ANOVA results. The data in this study was not always normally distributed and the population variances were not always equal, however the ANOVA analysis is robust to deviations from normality and can provide accurate estimates of the analyzed variables (Plichta & Garzon, 2009). For all of the reflection items, Mauchly's test of Sphericity indicated the chi-square value was less than 0.05 and therefore the assumptions of normal within-subjects ANOVA were violated (Brace, Kemp & Snelgar, 2000). Therefore, the Greenhouse-Geisser correction factor was used for degrees of freedom. Even though each analysis used different data points, researchers used a conservative p-value of 0.008 (p=0.05 / 6 ANOVAs for each set of analyses) to determine significance. Tables 8 and 9 shows the means and standard deviations of ratings of reflective statements by discipline and time (i.e. before and after the IPE experience), respectively. Table 10 summarizes the ANOVA results comparing SLP and education participants. Table 11 summarizes the ANOVA results comparing participant ratings before and after the IPE experience.

Table 8

Means and standard deviations for confidence ratings for reflective statements by SLP and Education participants, before and after the IPE experience

Reflective Statements	**SLP participants**				**Education participants**			
	Pre-IPE	**SD**	**Post-IPE**	**SD**	**Pre-IPE**	**SD**	**Post-IPE**	**SD**
Knowledge of appropriate referrals	3.50	0.67	4.04	0.97	3.45	0.88	3.68	0.94
Skill in clear and concise communication	3.79	0.72	4.23	0.47	3.95	0.60	4.28	0.68
Skill in identifying discipline-specific terminology	3.72	0.64	4.10	0.54	3.51	0.79	4.03	0.49
Skill in defining discipline-specific terminology	3.75	0.81	4.08	0.65	3.52	0.75	4.03	0.53
Skill in all areas of collaboration	3.47	0.95	3.96	0.76	4.05	0.78	4.13	0.72
Knowledge and skills in conflict management	4.17	0.58	4.38	0.49	4.31	0.57	4.23	0.54

Notes: IPE = Interprofessional education. SD = standard deviation. SLP = speech-language pathology.

Table 9

Overall means and standard deviations for confidence ratings for reflective statements before and after the IPE experience

Reflective Statements	**Mean before IPE**	**SD before IPE**	**Mean after IPE**	**SD after IPE**
Knowledge of appropriate referrals	3.48	0.76	3.88	0.97
Skill in clear and concise communication	3.86	0.67	4.25	0.57
Skill in identifying discipline-specific terminology	3.63	0.71	4.07	0.52
Skill in defining discipline-specific terminology	3.66	0.79	4.05	0.60
Skill in all areas of collaboration	3.72	0.93	4.03	0.74
Knowledge and skills in conflict management	4.23	0.58	4.32	0.51

Notes: IPE = Interprofessional education. SD = standard deviation.

Table 10

ANOVA results comparing SLP and Education participant confidence ratings for reflective statements

Reflective Statements	Degrees of Freedom (k-1)	Degrees of Freedom (Error)	F-value	Sig. (p-value)	Partial Eta Squared
Knowledge of appropriate referrals	1.000	105.000	2.394	0.125	0.026
Skill in clear and concise communication	1.000	105.000	1.051	0.308	0.012
Skill in identifying discipline-specific terminology	1.000	105.000	2.013	0.160	0.023
Skill in defining discipline-specific terminology	1.000	105.000	1.822	0.180	0.020
Skill in all areas of collaboration	1.000	105.000	6.912	0.010	0.071
Knowledge and skills in conflict management	1.000	105.000	0.002	0.964	0.000

Notes: Greenhouse-Geisser correction was used for degrees of freedom. Significant at $p < 0.008$ level

Table 11

ANOVA results comparing confidence ratings before and after the IPE experience for reflective statements for combined data from both groups

Reflective Statements	Degrees of Freedom	Degrees of Freedom (Error)	F-value	Sig. (p-value)	Partial Eta Squared
Knowledge of appropriate referrals	1.000	105.000	9.420	0.003	0.095
Skill in clear and concise communication	1.000	105.000	20.798	< 0.001	0.188
Skill in identifying discipline-specific terminology	1.000	105.000	25.527	< 0.001	0.227
Skill in defining discipline-specific terminology	1.000	105.000	15.962	< 0.001	0.149
Skill in all areas of collaboration	1.000	105.000	8.505	0.004	0.085
Knowledge and skills in conflict management	1.000	105.000	1.096	0.298	0.012

Notes: IPE = Interprofessional education. Greenhouse-Geisser correction was used for degrees of freedom. Significant at $p < 0.008$ level.

No differences were found between participants in speech-language pathology and education for any of the reflective statements. This indicated that responses were not

specific to a single discipline and responses were similar between the groups. All within-group differences examining changes from before to after the IPE experience were significant, with the exception of the statement related to conflict management. It is noteworthy that the mean ratings for both groups after the IPE experience are consistently higher after the IPE experience. This indicated participants felt more confident in their collaborative skills (with the exception of conflict management) after the IPE experience. Finally, as the data was not normally distributed, caution must be exercised when interpreting effect sizes in terms of percentiles (Coe, 2000). There is a small effect size for between group differences. However, partial eta-squared values for the within-groups results indicated a greater effect size across the IPE experience. Results indicated a higher probability that one could accurately determine whether the score was from before or after the IPE experience, if given the reflective rating (i.e., the higher rating of confidence in a collaborative competency was likely to have been reported after the IPE experience) (Coe, 2000).

Overall the results for the construct of personal reflections related to self-evaluation of collaborative competencies showed that while participants rated themselves as more competent in areas of collaboration, they still recognized the need for additional development as indicated on the open-ended question. Participants most frequently identified Communication and Role-Clarification as areas of weakness.

Construct 2: Knowledge and ability to outline/understand professional roles

Response item 1: descriptions of each discipline's professional roles (open-ended question on reflective survey).

Questions from reflective survey (Appendix A-1 and A-2).

1. What is the role of a speech-language pathologist within the school system?
2. What is the role of a teacher within the school system?

3. What is the role of a speech-language pathologist in providing services to students with speech and/or language concerns?
4. What is the role of a teacher in providing services to students with speech and/or language concerns?

Summary of professional roles coding structure (Appendix G). Participant responses guided the development of the coding structure to analyze description of professional roles through summative content analysis. Results of the summative content analysis resulted in five main content categories: Target Population (who), Professional Responsibilities (what), Service Delivery Structure (how), Service Delivery Location (where), and Anticipated Results (why).

The content category of Target Population had two codes. Either the professional was responsible to a subset of students with identified and/or individual needs ('Student') or an entire body of students such as a classroom ('Classroom').

The content category of Professional Responsibilities included the following codes:

- 'Assessment' –assessment and diagnosis, tracking and reporting progress
- 'Treatment' – providing direct and specialized treatment or intervention
- 'Screening' – measures taking before 'assessment' to identify potential candidates for further assessment
- 'Advocate'– promoting access to service for clients
- 'Refer' – referring individuals for additional assessments or intervention by other professionals
- 'Prevention' – measures taken that would prevent later-developing problems
- 'Facilitate' – indirectly affecting change with emphasis on student accomplishment and the professional providing support to students

- 'Mentor'– positive relationship building with students and acting as a role model
- 'Teach' – directly teaching
- 'Adapt' – modifying teaching to meet the individual needs of students and implementing strategies recommended by another professional
- 'Treatment Planning' – planning treatment, overall and otherwise, without reference to implementing the treatment. This code does not refer to planning of specific sessions or lesson planning.

The content category of Service Delivery Structure included codes that outlined how the professional configured his or her interactions with other professionals. There were five codes for the Service Delivery content category. The first code referred to the consultation model ('Consult') where information was transmitted in a unidirectional manner from one expert to a recipient of the information. The second code made reference to a collaboration model ('Collaboration') where information was exchanged in a bidirectional manner and there was no identifiable 'expert'. The third code in the Service Delivery content category spoke to the transdisciplinary model ('Trans') where the participant described the sharing of roles between professionals. A code related to the mixing of multiple models of service delivery ('Mixed-SD') also captured when participants identified two or more models of service delivery. Finally, a code referencing the act of asking for a consultation ('Seek Consult') captured responses in which participants indicated that some professionals have the role of seeking out consultation when they need additional resources or support.

Participants also made reference to the content category of Service Delivery Location. Codes for this category included specialized services provided In-Class ('In'), Outside the Classroom ('Out') or a combination of delivering service delivery within and outside the classroom ('Mixed Location')

Finally, for the content category of Anticipated Results, some participants discussed the purpose of the profession's role as improving the students' function in the classroom, at home, and in society ('Functional Outcome'). Finally participants discussed the context in which the professional works indicating administration plays a role in how and what role professionals carry out ('Admin.'). Administration could include school administration or governing bodies, such as provincial governments. The percentage of SLP participants and education participants who referred to each of the categories is indicated in Table 12.

Table 12

Percentages of participants who described specific aspects of professional roles for speech-language pathologists and teachers

		Role of the Speech-Language Pathologist				**Role of the Teacher**			
		SLP Pre	**SLP Post**	**Ed Pre**	**Ed Post**	**SLP Pre**	**SLP Post**	**Ed Pre**	**Ed Post**
Target Population	Student*	74%	89%	96%	87%	30%	28%	20%	30%
	Classroom*	30%	17%	2%	0%	91%	87%	93%	92%
Professional Responsibilities	Assessment	61%	56%	30%	44%	13%	18%	13%	13%
	Treatment	75%	73%	79%	75%	6%	5%	1%	3%
	Screen	5%	6%	1%	0%	15%	11%	7%	10%
	Advocate	2%	4%	1%	0%	0%	6%	3%	4%
	Refer	2%	3%	0%	0%	29%	35%	11%	16%
	Prevent	4%	2%	0%	0%	0%	0%	0%	0%
	Teach	0%	0%	0%	0%	51%	47%	30%	36%
	Facilitate	17%	10%	22%	21%	29%	36%	57%	49%
	Mentor	0%	0%	0%	0%	6%	3%	9%	0%
	Adapt	0%	2%	1%	0%	38%	40%	31%	27%
	Treatment Planning	5%	9%	10%	11%	2%	0%	1%	0%
Service Delivery Structure	Consult	48%	47%	21%	20%	28%	24%	12%	14%
	Collaborate	21%	30%	8%	19%	19%	20%	7%	9%
	Trans	0%	6%	0%	0%	1%	1%	0%	0%
	Mixed Service Delivery	6%	17%	1%	4%	3%	9%	0%	1%
	Seek Consult	0%	0%	0%	0%	0%	8%	2%	3%
Service Delivery Location	In	18%	23%	2%	9%	0%	0%	0%	0%
	Out	18%	24%	0%	7%	0%	0%	0%	0%
	Mixed Location	15%	18%	0%	5%	0%	0%	0%	0%
Anticipated Outcome	Functional Outcome	5%	3%	1%	3%	4%	4%	9%	9%
	Admin.	7%	1%	0%	0%	4%	2%	8%	1%

Notes: Ed = education participants. SLP = speech-language pathology participants. Trans = transdisciplinary

In response to this question, participants consistently commented on the population the professional served. Both SLP participants and education participants frequently identified the population served by the speech-language pathologist as individual students with exceptional needs, and the role of the teacher as being with the entire classroom. SLP participants regularly identified their responsibilities to involve mostly assessment and treatment while teachers repeatedly reported the speech-language pathologist role to be primarily assessment based. Both SLP and education participants frequently reported that the responsibility of the teacher is to teach and facilitate learning. It was occasionally reported that the teacher had a responsibility to adapt their classroom activities to meet the individual needs of the students. Participants from both disciplines mentioned consultation more frequently than collaboration as the method of service delivery for speech-language pathologists. Both disciplines identified consultation and collaboration with almost the same frequency as a service delivery structure for teachers to use. Comments about the location of service were infrequent, but SLP participants mentioned both in and out of class options as locations for SLP services. Interestingly, the location of service delivery was never mentioned for teachers and we can extrapolate that by identifying that the teacher targets teaching and facilitating for the entire classroom that their service delivery would take place primarily in the classroom.

Response item 2: application of professional roles and responsibilities (case study description). During the case study, each group (which consisted of individuals from both disciplines) outlined the roles of teachers and speech-language pathologists for the classroom situation portrayed. Responses to this component were examined from the content category of Target Population. Researchers determined whether the group identified the Target Population (Students or Classroom) belonged within the responsibilities of speech-language pathologists, teachers, or both. It was possible for the groups to identify both Target Populations as being the responsibility of either profession. Results are displayed in Table 13.

Table 13

Percentage of groups who identified target populations for respective disciplines (collaborative case study)

	Speech-Language Pathologists	**Teachers**
Student	96%	42%
Classroom	83%	100%

These results indicate that the groups recognized that the speech-language pathologist could have a role with the individual students but also contribute to the education of the entire classroom. The primary role of teachers was seen as the entire classroom, but with some applications to support of the individual student.

Response item 3: self ratings of knowledge of when to make referrals (Likert scale ranking on reflective survey). When participants reflected on their collaborative competencies they were asked to rank their confidence with the statement "I know how and when to involve other professionals in providing services to school-aged children with exceptional concerns". This can be related to their confidence in the knowledge of the roles of other professions. As reported in the results section for the construct of Personal Reflections Related to Self-Evaluation of Collaborative Competencies, it was noted that there was not a significant difference between SLP and education participants, but a significant difference did exist from before to after the IPE experience. Please refer to tables 8 and 9 for full results. These results indicated that participants felt more confident making appropriate referrals to outside professionals in providing services to students with exceptional concerns after the IPE experience.

Overall, these results showed participants largely acknowledge the speech-language pathologist's role to be with individual students with exceptional needs and the role of the teacher to be within the classroom. However, when participants applied their understanding of roles to the authentic case study, participants frequently identified the role of the speech-language pathologist could be within the classroom as well as with

the individual students. Participants also identified the role of the speech-language pathologist most frequently as being that of Assessment and Treatment, and the role of the teacher as Teaching, Facilitating, and Adapting. Finally, participants identified they felt more comfortable making referrals to other professionals after the IPE experience, which could be an indicator that they felt more confident in the role of the other professional.

Construct 3: Communication skills, specifically the ability to identify and reduce discipline-specific terminology

Response item 1: explanation of discipline-specific concepts to individuals outside of own discipline (open-ended questions on reflective survey).

Summary of discipline-specific terminology (jargon). Researchers used a list of criteria to develop a list of SLP jargon, teacher jargon, and jargon used by both disciplines in response to two questions (Appendix H). The two questions were:

- explain to a parent the role and process of assessment in your profession, and
- explain to a parent the connection between spoken language (i.e., speech and language) and reading/writing.

The two questions combined yielded a total of 55 different jargon words used by participants. Interestingly, SLP participants used 44 of the jargon words, 7 were used only by education participants and only 4 words were used by both disciplines. SLP jargon words included 'articulation', 'graphemes', 'intelligible', 'orthography', 'sound-letter correspondence' and 'standardized test'. Education jargon words included 'differentiated instruction', 'formative and summative', and 'program of studies'. Jargon words used by both disciplines included 'decode', 'developmental functioning/appropriate', 'formal and informal' and 'receptive and expressive'. The total list of jargon words by discipline is included as Appendix J. Table 14 and 15 contrast examples of responses from participants varying numbers of jargon words.

Table 14

Examples of SLP and education participant responses explaining the role of assessment in their profession, organized by use of discipline-specific terminology

Participant Discipline	Responses free from discipline-specific terms	Responses with discipline-specific terms
SLP	"The purpose of assessment is to find the areas in speech, language, and communication that a child may be having difficulty in and to provide treatment and strategies to help the child in that area. A child is observed and given several tasks and their performance in these tasks is measured to determine if these are areas of concern for that particular child." (SLP participant, 128 post-IPE reflective survey) "Assessment is an important part of therapy that is done to determine what your child's strengths and weaknesses are. This helps us determine what we may need to work on and what skills we can build on." (SLP participant, 119 pre-IPE reflective survey)	"To see if the child has a disability and if so, if what **domains of language**. Use **standardized test** to see if there is a problem then do more **informal probes** and language samples to see exactly where the problem is (**semantics**, **syntax**, **pragmatics**. . .)" (SLP participant, 117, post-IPE reflective survey)
Education	"Assessment is used to show what students understand and may need more help with. Assessment may be used for leaning – to pin point areas that need to be revisited, or of learning - to demonstrate the student's understanding of the concepts. Assessment helps teachers with planning for the year, near future or the next day and will help give students the individual help that he/she may need" (Education participant, 203 pre-IPE reflective survey)	• "The role of assessment is to determine the students standing in the classroom on a given activity. • Allows the teacher to reflect on teaching (how to improve it) • Shows what needs to be improved in the students • The process of assessment is clearly defined by the teacher to the students • Sometimes **formal/informal** • Must reflect on the **program of studies"** (Education participant, 321 pre-IPE reflective survey)

Note: SLP = speech-language pathology

Table 15

Examples of SLP and education participant responses explaining the connection between oral and written language, organized by use of discipline-specific terminology

Participant Discipline	Responses free from discipline-specific terms	Responses with discipline-specific terms
SLP	"There is a strong but complex connection between the spoken language and reading/writing. Reading and writing are language based, and children begin to learn to read and write based on the language they have gained through speaking. Reading/writing can also increase vocabulary in the spoken language. Also they are all forms of communication" (SLP participant, 118 pre-IPE reflective survey)	"Spoken language is the generation of **grammatical structures** and vocabulary. This does not require explicit knowledge of **phonemes** or the alphabet. However, reading and writing requires **phonemic awareness** and requires the child to make **letter-sound correspondences**. Reading helps to increase vocabulary and introduce new **grammatical forms** to the child. Writing is the creative generation of these **grammatical structures** and vocabulary" (SLP participant, 116 pre-IPE reflective survey)
Education	"Spoken language generally develops sooner than reading and writing skills. After developing spoken language ability, the child begins to connect their knowledge of word sounds with the idea that they can be represented in writing. Over time, children make specific connections to oral sounds and written letters and words to learn to read and write." (Education participant, 211 pre-IPE reflective survey)	"Spoken language refers to the way children communicate to peers, adults, etc. using their mouth or other methods to create sounds. It is a way to express themselves (as is writing). With reading (**receptive language**) and writing it is also a mental process but it requires movement of their hands and eyes and **fine motor skills** (for writing). Some children have trouble seeing the connection between spoken and written language." (Education participant, 321 post-IPE reflective survey)

Notes: SLP = speech-language pathology

ANOVA and post-hoc analysis. A quantitative analysis in the form of ANOVA analysis and a post-hoc t-test analysis were performed once the number of jargon terms used by each participant on both questions was obtained. Table 16 shows the mean number of jargon terms used by participants from each discipline before and after the IPE experience. The preliminary ANOVA analysis conducted yielded a significant between-groups difference ($F(1, 105) = 23.979$, $p < 0.001$, partial eta squared = 0.186).

A post-hoc regression analysis was conducted to determine if an adjustment to account for the initial difference between SLP-education participant groups, would affect the post-IPE between-groups difference. The regression analysis showed that when adjusted to account for the initial discrepancy between the groups, there was not a significant difference between SLP and education participants (b = -0.261, t(106) = -0.97, p = 0.335, R^2 = 0.206, F(2, 104) = 13.52, p < 0.00).

The initial ANOVA analysis showed a significant difference within-groups before and after the IPE experience (F (1, 105) = 6.137, p = 0.015). A post-hoc pairwise comparison using a Bonferroni correction showed a significant difference within the SLP group before and after the IPE experience (t (54) = 2.801, p = 0.007). The post-hoc pairwise comparison showed that there was not a significant difference within the education group before and after the IPE experience (t (51) = 0.131, p = 0.896). These results showed that SLP participants used significantly more jargon than teachers before the IPE experience. After the IPE experience, SLP participants showed a significant decrease in their use of jargon words, and after a correction for the initial between groups difference, there were no significant differences between the two groups. Teachers used very little jargon before the experience and did not show any change in their use of jargon after the IPE experience.

Table 16

Summary of mean and standard deviation of discipline-specific terms used by participants from each discipline before and after the IPE experience

Participant Discipline	**Before IPE**	**Before IPE SD**	**After IPE**	**After IPE SD**
SLP	1.96	1.91	1.22	1.71
Ed	0.48	0.92	0.46	0.78

Notes: Ed = education. IPE = Interprofessional education. SD = standard deviation SLP = speech-language pathology.

Response item 2: explanation of service delivery plan to individuals outside of both disciplines (open ended question on collaborative case study). The collaborative case study asked participants to explain their intervention plan for one specific student to the student's parents. The number of jargon words used in that description was counted for each group response. For this task, groups only used 6 discipline-specific words. These words were:

- Articulation
- Digit fidget
- Intelligibility
- Phonological awareness
- Segmenting & Blending
- Sound-letter correspondence

Table 17

Summary of percentages of groups of participants that used numbers of discipline-specific terminology in explanation of an intervention plan to parents (collaborative case study)

	Number of discipline-specific terms						
	0	**1**	**2**	**3**	**4**	**5**	**6**
Percentage of groups	58%	29%	8%	0%	0%	0%	4%

These results indicated that the majority of groups used 0 – 1 jargon words in their explanation of an intervention plan to parents. Only one group used all of the six identified jargon words in their explanation. It can be noted that five of the six words used on the collaborative case studies were identified as being used only by SLP participants on the reflective surveys.

Response item 3: awareness of discipline-specific terms in isolation (categorical ranking from reflective survey).

Determining discipline-specific terms. Participants were presented with twenty-two words, which were identified in the literature as "belonging" to the SLP discipline,

the education discipline, or both. Participants were asked to rank their personal familiarity with the words on a scale of one to four. Rankings were 'I have never heard this word before' (1), 'I have heard this word before but don't know what it means' (2), 'I have heard this word before and vaguely know what it means' (3), and 'I can define this word' (4). Participant responses were categorized as being an 'SLP term', an 'education term', or a 'cross-disciplinary term' based on the ratings received from participants. Words that the majority of one discipline ranked as a three or four (knowing what it means) and the majority of the other discipline ranked as one or two (not knowing what it means), were determined to "belong" to the first discipline. For example, 100% of SLP participants indicated familiarity with the word 'lexicon', while 65% of education participants rated their familiarity as a one or a two. Therefore, 'lexicon' was categorized as an SLP discipline term. A word was categorized as a 'cross-disciplinary term' when participants from both disciplines indicated familiarity with a word. Table 18 shows a summary of discipline categorization of terms.

Table 18

Summary of discipline categorization of words

SLP Terms	***Education Terms***	***Cross-disciplinary Terms***
AAC *Lexicon*	*Advanced Organizers* *Differentiated Instruction*	*Discourse* *Disfluency* *Constructivism* *Expressive Language* *Homogeneous Groupings* *Inclusion* *IPP* *Learning Disability* *Phonological Awareness* *Program of Studies* *Narratives* *Pedagogy* *Phonics* *Phonology* *Pragmatics* *Program of Studies* *Receptive Language*

Notes: SLP = speech-language pathology. AAC = augmentative and alternative communication.

Awareness of own discipline-specific terminology. Participants were also asked to identify whether speech-language pathologists, teachers, or both disciplines would know the list of words from above. Table 19 examines the proportion of the participant population who indicated varying levels of awareness related to discipline-specificity of words (i.e., which discipline would know the word).

Table 19

Percentages of SLP participants identifying varying awareness of discipline-specificity of SLP terms

	AAC		**Lexicon**	
	Pre-IPE	**Post-IPE**	**Pre-IPE**	**Post-IPE**
Speech-language pathologists know this word	55%	87%	36%	55%
Teachers know this word	--	--	--	--
Both speech-language pathologists & teachers know this word	45%	13%	64%	45%

Notes: AAC = augmentative and alternative communication. IPE = Interprofessional education. SLP = speech-language pathology. *'Lexicon' was a word that was addressed in the interactive seminar as being SLP – specific terminology, while 'AAC' was not addressed in the seminar*

Table 20

Percentages of education participants identifying varying awareness of discipline-specificity of education terms

	Differentiated Instruction		**Advanced Organizers**	
	Pre-IPE	**Post-IPE**	**Pre-IPE**	**Post-IPE**
Speech-language pathologists know this word	2%	--	10%	10%
Teachers know this word	37%	73%	18%	30%
Both speech-language pathologists & Teachers know this word	61%	28%	71%	60%

Notes: IPE = Interprofessional education. Differentiated instruction' was a word that was addressed in the interactive seminar as being education discipline-specific terminology, while 'advanced organizers' was not addressed in the seminar.

These results showed that both SLP and education participants increased their awareness of their own discipline terms in isolation whether or not the term was directly taught in the seminar. They showed this understanding by decreasing their ranking of the word as being known by both disciplines and transferred their selection to identify the term as belonging to only their own discipline.

Response item 4: self-ratings of skills in communication: clear and concise communication and identifying/defining jargon terms (Likert scale ranking on reflective survey). When participants reflected on their collaborative competencies they were asked to rank their confidence with the statements:

- "I am a clear and concise communicator when working on professional teams"
- "I am able to identify discipline-specific terms, that would not be known by people outside my discipline"
- "I am able to define discipline-specific terms for parents in a way they will understand."

These items are related to confidence in skills as communicators. As reported in the results section for the construct of 'Personal Reflections Related to Self-Evaluation of Collaborative Competencies' construct, it was noted that a between-groups difference did not exist for any of the statements, but a within-groups difference was significant for all three statements. Please refer to tables 8 and 9 for full results. These results indicated that regardless of discipline, participants felt more confident in their ability to communicate after the IPE experience.

Overall, the results for the Communication construct show that participants increased their awareness of discipline-specific terminology. Participants also applied this knowledge in authentic situations and, for SLP participants, the IPE experience seemed particularly helpful in decreasing the number of jargon terms they used in authentic explanations to parents. All participants indicated an increased confidence in their personal abilities to communicate clearly, identify jargon terms, and define these jargon terms appropriately.

Construct 4: Knowledge and understanding of models of specialized service delivery in schools

Response item 1: application of models of service delivery (open-ended response from reflective survey).

Summary of coding structure (Appendix I). Participants were asked to respond to an authentic situation and outline all possible models of service delivery that could be applicable to the scenario provided. The question stated, "Sheila is a speech-language pathologist who has been assigned to provide support to Janine's classroom. Janine's classroom is inclusive and therefore has students with varying abilities and a few with special needs. Explain to Sheila and Janine the different ways their professional contributions can be structured to meet student needs." The directed content coding structure used to analyze questions related to models of service delivery was adapted and derived from Flynn (2010), Hall & Weaver (2001), and Minore & Boone (2002). The coding structure grouped configurations of service delivery into four categories (Hall & Weaver, 2001): Multidisciplinary, Consultation, Interdisciplinary, and Transdisciplinary. Multidisciplinary teams are distinguished by a distinction between professionals with little to no communication between disciplines, even though they may be working with the same population. Any reference to a pull-out method was considered an application of the Multidisciplinary model. Consultation refers to a model where there is a referral system and experts are called in to comment on and make recommendations on a case (Minore & Boone, 2002). Interdisciplinary teams exist when professionals work together and engage in two-way communication, but each profession maintains their own distinct role (Hall & Weaver, 2001). Reference to the configurations of one-teach/one-drift, one-teach/one-observe, station teaching, remedial (i.e., when a professional re-teaches material), or supplemental teaching (i.e., when a professional teaches the same material but in a new way and with new materials) (Flynn, 2010) would be considered to belong to the Interdisciplinary category. Transdisciplinary teams are defined as having a large amount of professional overlap and professionals sharing roles and responsibilities. A Transdisciplinary approach requires extensive

communication as professionals are expected to assume the roles of professionals belonging to other disciplines (Hall & Weaver, 2001). The Transdisciplinary category included any reference to parallel, team or co-teaching (Flynn, 2010). Table 21 shows the percentages of participants who made references to the different models of serviced delivery as captured in the coding structure.

Table 21

Percentages of participant responses that made reference to models of service delivery

	SLP Pre-IPE	SLP Post-IPE	Ed Pre-IPE	Ed Post-IPE
Multidisciplinary	29%	32%	17%	31%
Consultation	39%	17%	13%	14%
Interdisciplinary	55%	42%	27%	72%
Transdisciplinary	16%	32%	2%	33%

Notes: SLP = speech-language pathology participants, IPE = Interprofessional education, Ed = education participants

These results indicated that education participants infrequently mentioned any specific method of service delivery before the IPE experience, and after the IPE experience regularly reported interdisciplinary as a method of service delivery with occasional reports of the other methods of service delivery. SLP participants on the other hand referenced all methods of service delivery before the IPE experience, and after the IPE experience frequently reported only Multidisciplinary, Interdisciplinary, and Transdisciplinary models of service delivery. It is noteworthy that after the IPE experience, SLP participants less frequently identified the Consultation model (39% compared to 17%). Participants from both disciplines most frequently reported the general Interdisciplinary model as a method of service delivery after the IPE experience (42% and 72% respectively).

Response item 2: application of models of service-delivery (open-ended response from case study). Groups of participants were asked to design a plan for service intervention for a classroom. These descriptions often included several ways that the teacher and speech-language pathologist could serve the target population.

Researchers documented the *most* collaborative service delivery described by groups. Table 22 reports the percentages of groups that mentioned one of multidisciplinary, interdisciplinary, or transdisciplinary as the maximally collaborative service delivery model.

Table 22

Percentages of groups with identified maximally collaborative model of service delivery.

	Most Collaborative Model of Service Delivery Included		
	Multidisciplinary	**Interdisciplinary**	**Transdisciplinary**
Percentage of groups that described models	--	17%	83%

The participant groups also described specific applications of service delivery models in their intervention plan for a classroom. These applications included Classroom, Pull-Out and Consultation. The percentage of groups, which included these, is included in Table 23.

Table 23

Percentage of groups that included application of service delivery models

	Application of Service Delivery		
	In the Classroom	**Pull – Out**	**Consultation**
Percentage of groups that applied service delivery	100%	91%	43%

These results showed that most groups referenced an approach that included a service delivery model with a transdisciplinary focus where professionals shared and exchanged roles. Also, all groups indicated that they wanted to design an intervention program that included the speech-language pathologist working within the classroom. It is also interesting that almost all the groups identified the need for additional pull-out programming for students with exceptional needs.

Response item 3: strengths and weaknesses of consultation and collaboration (open-ended responses from reflective survey). Participants were asked to identify two strengths and two weaknesses for a consultation model and a collaboration model. Participants were given a broad definition of the models before asked to give the strengths and weaknesses. Collaboration was defined as occurring "when professionals from different disciplines work together towards common goals" and consultation was defined as occurring "when a professional is called upon to provide information from their area of expertise to help guide the decisions of another professional". Researchers created a summative coding structure derived from participant responses. This coding structure only had two levels: codes and sub-codes. Sub-codes were primarily used to provide further detail of the code and reliability measures were only conducted on codes. There were eight main codes used to summarize the responses provided by participants. Each code could be interpreted as either strength or a weakness of consultation or collaboration. The full coding structure can be found in Appendix J. The first code was related to the efficiency or inefficient use of time ('Time'). A response that said "less . . . time required of the expert" (SLP participant, 112 pre-IPE reflective survey) or a participant who stated "often difficult to arrange mutual time" (Education participant, 210 pre-IPE reflective survey) would both receive the code 'Time'; however, the former would be identified as a strength and the latter as a weakness. The second code was labeled as 'Views' and made reference to the benefits or hindrance of multiple views as well as references to limited views or knowledge. For example, a strength that was coded 'Views' was "they have the expertise and can make informed decisions" (Education participant, 202 post-IPE reflective survey) and a weakness that was coded 'Views' read, "could be unsuccessful if the two disciplines do not agree" (SLP participant, 102 pre-IPE reflective survey). The code 'Location' made reference to benefits of close proximity and possible concerns related to sharing spaces. For example, Education participant 201 on the post-IPE reflective survey stated, "It becomes difficult to meet when one or more expert are off site from where the child or the goal needs support". The code 'Location' was also used to refer to consistency

across environments for students receiving specialized services. For example, “you can work on common goals in different settings” (SLP participant, 105 pre-IPE reflective survey). Participants also made reference to effective and ineffective communication (‘Communication’). For example, participant responses that stated “When people collaborate, misunderstandings can be caught and corrected” (Education participant, 217 pre-IPE reflective survey) and “lack of communication, no talk of problems or progress” (Education participant, 202 post-IPE reflective survey), were respectively coded as ‘Communication – strength’ and ‘Communication – weakness’. Some participants also made reference to supportive interpersonal relations and interpersonal conflicts that may arise as the result of working together (‘Inter-personal’). The code titled ‘Service Delivery’ made reference to promoting accessibility and/or quality of service delivery and the potential for a decrease in quality service provision. An example of a strength that was coded as ‘Service Delivery’ was provided by SLP participant 139 on the post-IPE reflective survey, “more information can be provided to a greater number of individuals over a shorter period of time”. Education participant 328 on the post-IPE reflective survey provided a weakness that was coded as ‘Service Delivery’; “could hinder student learning if not done in a positive inclusive manner”. The seventh code, ‘Cost’ referred to the cost effectiveness of a model (e.g., “less cost to the system” – SLP participant, 139 post-IPE reflective survey) or the potential for the application of a model to be costly to the administrative system (e.g., “takes . . . money (travel)” – Education participant, 314 post-IPE reflective survey). Finally, the code ‘Roles’ was applied to responses that indicated the potential benefits or detriments of sharing roles, responsibilities, goals, workload, and resources, such as “they will learn about different things of their students that they might not otherwise know and they can work off of each other to develop programs to suit the student” (Education participant, 328 pre-IPE reflective survey) or “unequal distribution of work” (Education participant, 326 pre-IPE reflective survey). The code ‘Roles’ could also refer to awareness and clarity of the roles of own and other disciplines (e.g., “some responsibilities are not fulfilled because roles are not defined well enough or everyone

thinks that someone else is taking care of it" (SLP participant, 103 pre-IPE reflective survey). The last application of the code 'Roles' could refer to the role of a professional to implement programming for students, for example "too much information for the inner profession to handle and implement on their own" (Education participant, 323 post-IPE reflective survey). The full coding structure for strengths and weaknesses of consultation and collaboration can be found in Appendix J. Table 24 and 25 show the percentages of participants who mentioned various strengths and weaknesses of the consultation and collaboration models of service delivery, respectively.

Table 24

*Percentage of participants that indicated strengths and weaknesses of **consultation***

	Strengths				**Weaknesses**			
	SLP		**Ed**		**SLP**		**Ed**	
	Pre IPE	**Post IPE**	**Pre IPE**	**Post IPE**	**Pre IPE**	**Post IPE**	**Pre IPE**	**Post IPE**
Time	17%	26%	3%	9%	24%	13%	18%	21%
Views	59%	51%	88%	61%	67%	40%	95%	37%
Location	4%	--	3%	2%	2%	4%	3%	5%
Communication	2%	8%	--	--	9%	21%	3%	26%
Inter-Personal	7%	8%	15%	2%	50%	26%	41%	28%
Service Delivery	41%	38%	50%	39%	22%	30%	8%	16%
Cost	6%	6%	--	--	2%	2%	3%	5%
Roles	59%	47%	68%	45%	17%	53%	15%	21%

Notes: Ed = education participants. IPE = Interprofessional education. SLP = speech-language pathology participants.

Table 25

*Percentage of participants that indicated strengths and weaknesses of **collaboration***

	Strengths				Weaknesses			
	SLP		Ed		SLP		Ed	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Time	7%	8%	9%	3%	53%	62%	34%	41%
Views	65%	47%	72%	61%	56%	42%	79%	38%
Location	15%	19%	6%	13%	4%	--	--	5%
Communication	5%	8%	13%	11%	7%	17%	11%	24%
Inter-Personal	7%		23%	8%	44%	34%	23%	30%
Service Delivery	38%	62%	55%	47%	15%	21%	2%	5%
Cost	--	--	--	--	2%	4%	--	14%
Roles	62%	57%	36%	39%	18%	26%	6%	24%

Notes: Ed = education participants. IPE = Interprofessional education. SLP = speech-language pathology participants.

These results show that the frequencies with which participants reported strengths and weakness of collaboration and consultation were similar before and after the IPE experience. However, there were some instances where participant response frequency fluctuated from before to after the IPE experience. Before the IPE experience, education participants regularly identified 'Roles' as a strength of consultation (68%). After the IPE experience 'Roles' as strength was mentioned by 45% of Education participants. While, before the IPE experience participants from both disciplines identified 'Views' and 'Interpersonal' as weaknesses of consultation (67% and 95% respectively), after the IPE experience, 'Views' and 'Interpersonal' were infrequently reported as weaknesses of consultation by SLP participants and education participants (40% and 37% respectively). Only SLP participants identified 'Roles' as a weakness of consultation after the IPE experience (17% pre, 53% post). Regarding collaboration, there were a lower proportion of SLP and education participants who identified 'Views' as a strength (SLP: 65% to 47%, Education: 72% to 61%). Also, after the IPE experience, education participants seldom mentioned 'Inter-Personal' as a potential strength of collaboration after the IPE experience (8%). Finally, there was a downward shift in the

percentage of Education participants who identified 'Views' as a weakness of collaboration (79% to 38%).

Sometimes SLP and education participants reported frequencies of responses that were dissimilar. For strengths of consultation, education participants consistently identified 'Views', 'Service Delivery', and 'Roles' at a higher frequency than SLP participants (see Table 23). Before the IPE experience 95% of education participants compared to 67% of SLP participants identified 'Views' as a weakness of consultation. By the end of the IPE experience however, the two groups used 'Views' as a limitation with similar frequency (40% for SLP participants, and 37% for education participants). For collaboration, education participants again identified 'Views' and 'Service-Delivery' as strengths with a higher frequency than SLP participants (see Table 24). However, SLP participants consistently identified 'Roles' as a strength of collaboration at a higher frequency than education participants. Also, more than half of the SLP students identified 'Time' as a limitation of collaboration (62%), while less than half of education participants mentioned 'Time' (41%). Finally, before the IPE experience, when asked about the weaknesses of collaboration, 79% of education participants identified 'Views' as a weakness compared to 56% of SLP participants.

Overall, after the IPE experience participants seemed more aware of different models of service delivery and confirmed and slightly altered their view of the strengths and weaknesses of models of service delivery.

There were some trends in the strengths and weaknesses related to each model of service delivery. To make these comparisons, participant responses across disciplines and time were averaged (Table 26). This group of pre-professionals identified 'Views' (65%), 'Roles' (55%), and 'Service Delivery' (42%) as the primary strengths of consultation. There was an emphasis on 'Views' (60%) and 'Inter-Personal' (36%) as potential weaknesses of consultation. For collaboration, the pre-professionals identified 'Views' (61%), 'Service Delivery' (51%), and 'Roles' (49%) as the primary

strengths. The most frequently identified weaknesses of collaboration were 'Views' (54%), 'Time' (48%), and 'Inter-Personal' (33%).

Table 26

Average percentage of participants who identified different codes as strengths or weaknesses of consultation and collaboration

	Consultation		Collaboration	
	Strength	**Weakness**	**Strength**	**Weakness**
Time	14%	19%	7%	48%
Views	65%	60%	61%	54%
Location	2%	4%	13%	2%
Communication	3%	15%	9%	15%
Inter-Personal	8%	36%	10%	33%
Service Delivery	42%	19%	51%	22%
Cost	3%	3%		5%
Roles	55%	27%	49%	19%

Discussion

The discussion of the results is organized by the four collaborative constructs that were examined. The results for each construct will be discussed in conjunction with current and applicable literature.

Construct 1: Reflection and Self-Evaluation of Collaborative Competencies

This construct examined the reflections of participants to determine perceived changes in knowledge and skills related to collaboration. Participants in this study were asked to identify their own personal strengths and weaknesses in collaboration. Members of both disciplines identified strengths in the areas of Communication and Collaboration most frequently. Participants identified their areas of weakness to be in Communication and Role Clarification. The broad scope of the Communication code may have contributed to its popularity as a referent and therefore it was seen as both a strength and a weakness. When participants listed Communication as a strength, they were often referring to their skills in listening and speaking clearly and concisely. As a weakness, the Communication code was frequently used to refer to skills in conflict management, asking for clarification, and assertiveness. Before the IPE experience, the

majority of SLP participants identified Role Clarification as a weakness. This is not altogether surprising given that previous studies have shown that teachers and clinicians lack knowledge regarding professional roles of members outside their own profession (Nochajski, 2001). With this in mind, it is surprising that less than a third of teachers identified Role Clarification as area of weakness before and after the IPE experience. This finding could be interpreted in a few ways. It may be that pre-professional teachers are confident in their knowledge of professional roles because of their previous training and experiences. This would be disputed by the fact that less than twenty-percent of education participants identified Role Clarification as a strength. The second interpretation is that pre-professional teachers were more concerned with the process of collaboration and skills associated with the direct interaction with other professionals and did not consider the broader scope of collaboration in which they would be interacting with professionals with differing roles and responsibilities and this differentiation of roles would factor into their interactions. While the education participants did not identify Role Clarification as a weakness very often, the SLP population initially did. However, after the IPE experience only 36% of SLP participants identified Role Clarification as a weakness. This could indicate that the IPE experience helped SLP participants understand their own and other professional's roles feel confident in sharing their specialized knowledge and realize their potential in team roles such as leadership roles. There was no change in the frequency with which SLP participants listed Role Clarification as a strength from before to after the IPE experience, but this does not negate the fact that IPE may have simply alleviated some of the apprehension around Role Clarification reducing the frequency of Roles being cited as a weakness, but not affecting enough change to list it as a strength.

The second analysis conducted in the area of reflection and self-evaluation was a statistical analysis of responses to a Likert-scale rating of reflective statements. Across all statements, there were no significant differences between the groups. This shows that regardless of discipline, pre-professionals had similar ratings of their collaborative

competencies. However, in the pre-post comparison, there was a consistently significant increase in ratings of the collaborative competency areas directly addressed in the IPE experience. These included confidence in knowledge of professional roles, communication skills, and general skills of collaboration. The one reflective statement where a significant increase in confidence was not observed was related to conflict management. One could attribute the lack of change in confidence related to skills in conflict management to this statement having the highest mean confidence rating of all the statements. Perhaps participants did not feel more confident in their conflict management skills because they were confident in this area before the IPE experience even began. If interpreted as an indicator that participants did not feel their skills in conflict management improved through the IPE experience, the method in which conflict management was addressed in the IPE experience needs to be examined. Participants were provided with reading material on basic conflict management (McCorkle, 2002) prior to the IPE experience; however, it was not discussed in the interactive seminar or collaborative case study. The reflective statement regarding conflict management could serve as a control for this study as it demonstrates that participants did not blindly rank their confidence as higher in collaborative competencies after the IPE experience. It also demonstrates that providing pre-professionals with materials regarding aspects of collaboration was not an effective method to increase self-confidence and self-perception related to team-work skills.

Construct 2: Knowledge and ability to outline/understand professional roles

This constructed looked for changes in perceptions of own and other professionals' roles as a result of the IPE experience. Describing and understanding one's own and other professionals' roles is a critical skill for collaboration (Barr, 1998, as cited in Freeth & Reeves, 2004; Engel, 1994, as cited in Freeth & Reeves, 2004; Hornby, 2000 as cited in Freeth & Reeves, 2004; Nochajski, 2001). This IPE experience was designed to help pre-professionals learn about their own and other professional roles in the context of working in inclusive classrooms. Prior to the IPE, the vast majority of pre-professionals

described the role of professionals based on the population each discipline works with. Results showed that pre-professionals believed the teacher addresses the needs of the Classroom and the speech-language pathologist works with a sub-population of the classroom with exceptional needs (Students). Prior to the IPE, participants also addressed the professional responsibilities of the teacher and speech-language pathologist. The teacher's job was largely described as a 'teaching role', which encompassed Teaching, Facilitating and Adapting the curriculum to meet the individual needs of the students within the classroom. The role of the speech-language pathologist was typically described as involving Assessment and providing Treatment directly. This aligns with the medical model paradigm of disease and disability that may continue to persist in school systems (Hall, 2005; Hartas, 2004); despite a movement towards the WHO-ICF model that examines disability within the context of environment (WHO, 2001). In the medical model, impairment is identified, a diagnosis given, an assessment of strengths and weaknesses is conducted, and a plan is developed to individually tailor intervention to the needs of the client. Participants in this study rarely mentioned Collaboration or Consultation as part of either profession's professional roles. The most frequent mention of interaction and working with other professions occurred when SLP participants cited Consultation as part of their own role. SLP and education participants consistently reported Consultation as a method of service delivery more frequently than they referenced Collaboration. Completion of the IPE experience did not increase the frequency with which participants mentioned the structure of service delivery (i.e. consultation or collaboration). This might be due to the fact that participants do not consider the method by which professionals carry out their roles as part of the definition of roles. It might also indicate the belief that professionals work independently of one another in the school system and pre-professionals believe they do not have the professional responsibility to work with other professionals. If this were true, it would contraindicate the measures being taken by governing bodies to promote collaboration between professionals in schools such as the *Setting the Direction Framework* published by Alberta Education (Government of Alberta, 2009).

This notion will be refuted further in this paper, but it is important to consider the possibility that pre-professional speech-language pathologists and teachers are not being educated in a system that aligns with the collaborative mentality emphasized in models of practice. This could be the case, as the SLP and education pre-professional programs are mostly completed independent of other disciplines leading to role socialization (Bronstein, 2003). IPE movements, such as the one in this study, aim to counteract this effect through allowing pre-professionals to spend time together learning and interacting as per the Contact Theory and the proposed framework of cognitive gain (Wright, 1996; Sherif, 1996 as cited in Wright, 1996). Regardless, working together was not readily identified by participants as part of the professional roles of teachers and speech-language pathologists. This study shows that pre-professionals have a very rudimentary understanding of the roles of teachers and speech-language pathologists, and subscribe to the traditional models of the medical model and consultation. It demonstrated that components of their future professional roles most salient to pre-professionals were related to traditional roles and did not include the understanding that speech-language pathologists can serve classrooms, teachers can work with individual students with specialized goals, and both professionals can collaborate and work inside the classroom together. However, this study will show that a single exposure to IPE allowed pre-professionals to explore the potential expansion of their roles into these areas through exploration of service delivery models, discussed later in this section.

Construct 3: Communication skills, specifically the ability to identify and reduce discipline-specific terminology

This construct examined participants' ability to identify discipline-specific terminology and minimize terminology use in authentic written explanations of concepts.

Hall (2005) found that teachers identified differences in professional vocabularies and the use of discipline specific terminology by clinicians as one of the primary reasons for communication failures between clinicians and teachers. This IPE experience targeted

discipline specific terminology specifically by asking participants to identify and define terms specific to their disciplines in 'parent-friendly' terms. Both groups were familiar with the paradigm of 'parent-friendly' language that requires a reduced complexity of explanations for individuals with limited understanding of concepts of education, speech, language and communication. The context of the explanation task was directed towards parents so participants should have understood that 'jargon' terms and complex explanations were not appropriate. The statistical analysis of the frequency with which participants used jargon showed that SLP participants used significantly more discipline-specific terminology than education participants. Importantly, the quality of explanations did appear to be different between disciplines. Both disciplines were able to explain the concepts; the difference was the education participants were able to do so without the use of discipline-specific terminology. It is also of interest to note that, of the fifty-five jargon words identified by researchers, education participants used only seven terms. Not only were SLP participants using more discipline specific terminology, they were also using a broader range of terms that were considered jargon. Even with the emphasis being placed on 'parent-friendly' language in post-secondary preparation programs, the participants in this study from the discipline of speech-language pathology seemed to either disregard the need for jargon-free language or were unable to identify and limit their use of discipline-specific terminology. When participants were assigned to mixed-discipline groups and given an opportunity to explain a concept to parents, almost 90% of groups used zero to one jargon terms in their explanation. This demonstrated that when pre-professionals worked together, they were either working together to use less jargon terminology or they were simply using less discipline-specific terminology as a consideration of working with members of another discipline. Statistical analysis showed a significant decrease in the use of discipline-specific terminology used by SLP participants after the IPE experience concluded. This could be attributed to the increased awareness of discipline-specific terminology. Both groups were asked to rank their awareness of discipline-specificity of selected terms before and after the IPE experience. The results showed that a higher

proportion of participants were able to identify discipline-specific terms in isolation after the IPE experience. This improved skill of identification may account for some of the changes seen in the SLP participants' ability to reduce the number of jargon words used in explanations. This study showed that pre-professional speech-language pathologists used discipline-specific terminology in inappropriate contexts perhaps due to being unaware that the terms are not generally understood by the general population or other disciplines. Even though SLP participants continued to use more discipline specific terms than education participants after the IPE experience, all participants reported increased confidence in their ability to identify and define discipline-specific terminology after the IPE experience. Overall, the IPE experience appeared to counteract the primary barrier to collaboration between speech-language pathologists and teachers in the school system by raising awareness of and confidence in, the ability to manage use of discipline-specific terminology.

Construct 4: Knowledge and understanding of models of specialized service delivery in schools

This construct examined participants' responses in practical and authentic application tasks to determine awareness of multiple models of specialized service delivery and collaboration. The decision to include information on the specialized service delivery models available for speech-language pathologists and teachers was driven by the finding that an IPE course needs to be customized and reflect 'appropriate and relevant service delivery settings' (Hammick et al., 2007). With the current shifts taking place in the school system (Government of Alberta, 2009; ASHA, 2001), and traditional models of pull-out and consultation falling out of favor (Hartas, 2004; Prelock, 1997; ASHA, 1999), the IPE experience was an appropriate way to provide pre-professionals with some knowledge of these changes and the potential configurations for collaboration when they enter the workforce. Prior to the IPE, participants were asked to describe the different service delivery models that could be used between and speech-language pathologist and teacher in an inclusive classroom scenario. Initially, the majority of SLP participants indicated an Interdisciplinary approach characterized by an overarching

statement of 'working together'. Approximately 40% of SLP participants also recognized Consultation as the way in which teachers and speech-language pathologists interact. Education participants did not consistently identify a categorical service delivery model. Less than a third of education participants identified Interdisciplinary models and an even smaller percentage identified any other model. This showed that participants, specifically education participants, were largely unaware of different models of service delivery before the IPE experience. After the IPE experience, forty percent of SLP participants identified the Interdisciplinary model and almost three quarters of the education participants did the same. Approximately 30% of education and SLP participants recognized Transdisciplinary model and Multidisciplinary model of collaboration. After the IPE experience less than 20% of SLP participants applied Consultation service delivery models (compared to almost 40% before the IPE experience). When participants worked in mixed-discipline teams on the collaborative case study, all of the groups identified that speech-language pathologists should work in the classroom and over 80% of the groups used some form of Transdisciplinary collaboration when designing an intervention plan. Over 90% of groups continued to identify pull-out programming as an option for students with needs that required individual attention, such as articulation therapy. When participants were asked to apply their new knowledge of specialized service delivery, they showed a propensity to use the highly integrated services mixed with isolated services to best meet the needs of the population they were serving. The results from this study showed that the IPE experience accomplished the goal of raising awareness of different models of service delivery. It also helped to align pre-professional understanding of service delivery models with current view on service delivery, which are moving towards collaboration in the schools in lieu of consultation (Hartas, 2004; Government of Alberta, 2009; ASHA, 2001).

Aside from increasing awareness of service delivery models, participants were also asked to identify the strengths and weaknesses of consultation and collaboration.

When professionals are asked to identify the barriers to collaboration, they most frequently cite structural characteristics such as time commitments and a rationing of limited services coupled with a lack of administrative support. When pre-professionals were surveyed, the majority of participants identified Views as the primary weakness of collaboration. Views as a weakness referred to the potential conflicts of multiple views and references to limited views or knowledge. The next most frequently reported response was in relation to Time, followed by Interpersonal, which referred to personality conflicts. The responses from pre-professionals demonstrated a potential lack of knowledge related to collaboration existing within an administrative structure that, according to reports of professionals, is the primary barrier and weakness of collaboration. Pre-professionals cited the benefits of multiple Views, improved Service Delivery, and the sharing of goals (Roles) as the strengths of collaboration. This aligns completely with the theoretical purpose and rationale for collaboration. Collaboration is viewed as the remedy to fragmentation of knowledge caused by specialization (Kerr, 1982 as cited in Hall & Weaver, 2001) and the best method of providing services in complex areas such as child development (Wright, 1996). The participants in this study demonstrated an understanding of the theoretical rationale for collaboration. This study also examined the perceived strengths and weaknesses of consultation. Participants frequently identified limited and different Views as the weakness of consultation, and the bringing of new and varied Views as a strength of consultation. Participants also identified the sharing of resources (Roles) and increased breadth of Service Delivery as strengths of consultation. After limited Views, the next most frequently identified weakness of consultation was Interpersonal or personality conflicts or resistance to consultation from one or more professionals. Pre-professionals were able to generate valid strengths and weaknesses of consultation; however, they did not mention the largest cited weakness of consultation, the power differential between consultant and the recipient of collaboration (Hartas, 2004, Hall, 2005). Instead, participants tended to cite the limited Views of the expert to the functional impact of the disability. This is consistent with an education-based view of language that focuses

on the function and use of language instead of the forms and structures of language that are typically addressed by speech-language pathologists (Hartas, 2004). In this sense, the participants of this study demonstrated that the functional impact of language is crucial for professionals to understand before they are able to provide even indirect services. Thus, this group of pre-professionals also indicated a subscription to the WHO-ICF model of disability and impairment, whereby a disability is viewed within the context or environment instead of in isolation (World Health Organization, 2001) Overall, this study provided insight into the common perceptions of pre-professionals related to consultation and collaboration which can guide the future targets of IPE.

Discussion Summary

Within each of the four constructs, positive changes were recorded for participants from both the SLP and education disciplines. Not only did participants feel more confident in their skills related to knowledge of professional roles and communication skills, they demonstrated positive changes in these areas. Participants demonstrated their increased understanding of models of serviced delivery and their professional responsibilities to collaborate in a variety of ways to meet the needs of the population they are serving. All participants showed an increased awareness and a decreased use of discipline-specific terminology in authentic situations. This change related to discipline-specific terminology was especially evident in the SLP population.

Conclusions

Overall Results

This thesis project showed multiple positive effects of a single exposure to interprofessional education that consisted of reflective surveys, interactive seminar and a collaborative case study education and speech-language pathology pre-professionals. Positive effects from this carefully structured IPE experience were shown related to constructs of personal reflections, professional roles, communication and models of specialized service delivery in schools.

Implications for the IPE Experience

Even though the existing IPE experience was shown to elicit positive results, many improvements could be made that may increase the efficacy of the experience. The IPE experience could be extended to provide more time to engage with additional constructs of collaboration, such as the team-formation process, conflict management and communication skills beyond identifying and limiting use of discipline-specific terminology. It would also be of benefit to provide participants the opportunity to engage and apply the provincial curriculum as a part of the collaborative case study. Additional time could also be used to explore the administrative changes that are driving structural changes within the school system and provide more theoretical rationale for collaboration in the schools. Additional time would also allow pre-professionals to build more extensive and complex professional relationships and explore their own roles and skills in greater depth. It might also be beneficial to allow participants to attend a session led by professional representatives who are currently collaborating in the schools. These professional representatives would be able to provide participants with a reality based view of the school system and provide their unique insight into the potential for change within the existing system. Participants should also be encouraged to explore their own insights through free reflection, perhaps through a reflection journal. Ideally, this IPE experience should be included in a series of IPE experiences that bring together pre-professionals that work together in the school system to provide services to students with exceptional needs. This series could be expanded to include other programs such as pre-professional occupational therapists, physical therapists, nurses, psychologists, and educational assistants. It is important to consider the unique relationship between some of these professions, such as the overlap in language development that is addressed by both speech-language pathologists and teachers, and perhaps special sessions could be organized to address some of the more unique relationships. An attempt to include future IPE experiences into pre-existing courses would help to alleviate the perception of IPE as additional

effort by students. Ideally, IPE would occur frequently and naturally in the pre-professional training programs.

Limitations of the current study

This study strived to provide a broad overview of four constructs of collaboration. Consequently, results focused on breadth and may have lost some detail that could be achieved through a focused and in-depth study of a specific area affected by IPE. Some of the coding structures created from the data or from pre-existing sources were ineffective at capturing the depth of responses provided by participants in this study. These structures could be modified to provide more specific information related to participant responses (i.e., the use of sub-codes could be extended). The challenges in obtaining trustworthiness from more detailed coding would have to be considered if this were to be implemented. Also, the structured reflective survey did not afford participants with a robust opportunity to reflect on their IPE experience. A reflective journal in lieu of the structured surveys would have afforded participants the opportunity to discuss their thoughts without constraints; however, the surveys were necessary to gather information related to efficacy of the IPE experience. Due to a lack of participant interest, this study was unable to include information from focus groups, even though focus group information would have allowed for a more robust qualitative study. This study did not closely examine the unique population of SLP participants with a background in education or the education participants with an interest in pursuing further studies in speech-language pathology. Responses from these participants were included in the general population and not analyzed separately, thus emulating a realistic situation where professionals have varying levels of knowledge of the other profession as a result of their professional background. These special cases could have been extracted from the group and analyzed separately; however, this was not included in this study. No attempts were made to differentially assess the efficacy of the interactive seminar compared to the collaborative case study or the assigned readings. Only the efficacy of the IPE experience as a whole was examined, thus no conclusions

can be drawn regarding the efficacy of component parts. Also, this study could have used a more standardized measure of attitudes related to IPE to determine if this IPE experience had immediate and long-term effects on attitudes and perceptions related to collaboration. This study does not include information on the long-term efficacy of the IPE experience, specifically related to when pre-professionals enter the professional realm and being to apply their knowledge and skills to authentic situations. Finally, this study only looked at the efficacy of IPE education on pre-professionals as opposed to the broader population of pre-professionals and professionals who are working in the schools.

Implications for Future Research

Future studies are needed to corroborate and clarify the findings of this study. Focused studies on individual constructs, instead of four constructs, will provide more insight into the specific changes that an IPE experience is able to affect. There is a need for an examination of the group of SLP participants with a background in education and education participants with the intention of pursuing further studies in speech-language pathology would provide much needed information on this unique group of pre-professionals and the potential for this group to use their understandings to enhance the IPE experience. Future studies can utilize more thorough qualitative methods, such as the analysis of transcripts from focus groups, or quantitative methods, such as the use of standardized rating scales of attitudes and perceptions to provide further support for the inclusion of IPE experiences in pre-professional training programs. Examining the long-term effects of a single-exposure IPE experience would assist in developing a thorough understanding of the impact IPE can have on pre-professionals as they continue with their training programs and as they move into their professional roles either in supervised practicum or their first year of work. A study could also look at the efficacy of this IPE experience with professionals already working in schools with varying levels of experience. Finally, there is potential to expand this IPE experience to incorporate other pre-professionals, such as educational assistants, and other

therapists, who would be involved in the care, education, and development of students in the school system.

Final Thoughts

This study demonstrated some of the benefits of including an IPE experience in the pre-professional training of speech-language pathologists and teachers. It is hoped that a study such as this can promote the inclusion of this type of experience for pre-professional students in all post-secondary institutions, as it has the potential to prepare pre-professionals for the workplace and eventually assist the school system transition to a fully collaborative model.

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Appendix A-1
Reflective Survey (Pre-IPE)

Reflection Prior to Interprofessional Education Experience
SLP-Education Collaboration Project

1. What is the role of a speech-language pathologist within the school system?

2. What is the role of a teacher within the school system?

3. What is the role of a speech-language pathologist in providing services to students with speech and/or language concerns?

4. What is the role of a teacher in providing services to students with speech and/or language concerns?

5. Check all items that are within the range of responsibilities of a speech-language pathologist:
   - ☐ Use technology to enhance communication and learning
   - ☐ Teaching in accordance to the curriculum
   - ☐ Assess and treat stuttering
   - ☐ Provide intervention in the area of articulation or pronunciation of specific sounds
   - ☐ Teach punctuation
   - ☐ Teach spelling
   - ☐ Train social skills
   - ☐ Provide intervention to enhance listening and comprehension of spoken language
   - ☐ Develop speech-sound awareness in spoken language
   - ☐ Teach sound-letter correspondence
   - ☐ Assess academic performance
   - ☐ Assess and teach literacy and pre-literacy skills
   - ☐ Make referrals to other professionals when student display exceptional needs
   - ☐ Tailor academic instruction to match a variety of levels of learning

- ☐ Consistently upgrade professional knowledge through professional development
- ☐ Provide hearing screenings for students
- ☐ Teach formal writing such as how to write a business letter
- ☐ Encourage students to think about their language and how they are using language
- ☐ Expand and develop memory for auditory input
- ☐ Assess and provide intervention for feeding and swallowing disorders

6. Check all items that are within the range of responsibilities of a teacher:
   - ☐ Use technology to enhance communication and learning
   - ☐ Teaching in accordance to the curriculum
   - ☐ Assess and treat stuttering
   - ☐ Provide intervention in the area of articulation or pronunciation of specific sounds
   - ☐ Teach punctuation
   - ☐ Teach spelling
   - ☐ Train social skills
   - ☐ Provide intervention to enhance listening and comprehension of spoken language
   - ☐ Develop speech-sound awareness in spoken language
   - ☐ Teach sound-letter correspondence
   - ☐ Assess academic performance
   - ☐ Assess and teach literacy and pre-literacy skills
   - ☐ Make referrals to other professionals when student display exceptional needs
   - ☐ Tailor academic instruction to match a variety of levels of learning
   - ☐ Consistently upgrade professional knowledge through professional development
   - ☐ Provide hearing screenings for students
   - ☐ Teach formal writing such as how to write a business letter
   - ☐ Encourage students to think about their language and how they are using language
   - ☐ Expand and develop memory for auditory input
   - ☐ Assess and provide intervention for feeding and swallowing disorders

7. Categorize your familiarity with the words using the categories:
   - I have never heard this word before
   - I have heard this word but I don’t know what it means
   - I have heard this word before and I vaguely know what it means
   - I can define this word

	I have never heard this word	I have heard this word before but I don't know what it means	I have this word before and I vaguely know what it means	I can **define** this word
Advanced organizers	☐	☐	☐	☐
Alternative and Augmentative Communication	☐	☐	☐	☐
Articulation	☐	☐	☐	☐
Constructivism	☐	☐	☐	☐
Decoding	☐	☐	☐	☐
Differentiated Instruction	☐	☐	☐	☐
Disfluency	☐	☐	☐	☐
Expressive Language	☐	☐	☐	☐
Homogeneous groupings	☐	☐	☐	☐
Inclusion	☐	☐	☐	☐
Individualized Program Plan (IPP)	☐	☐	☐	☐
Learning Disability	☐	☐	☐	☐
Metalinguistic Awareness	☐	☐	☐	☐
Narratives	☐	☐	☐	☐
Pedagogy	☐	☐	☐	☐
Phonics	☐	☐	☐	☐
Phonology	☐	☐	☐	☐
Pragmatics	☐	☐	☐	☐
Program of Studies	☐	☐	☐	☐
Receptive Language	☐	☐	☐	☐

8. Categorize the following words using the categories:
    - A teacher would know & understand this word

- A speech-language pathologist would know & understand this word
- Both a teacher and speech-language pathologist would know and understand this word

	Teachers would know this word	SLPs would know this word	Both teachers and SLPs would know this word
Advanced organizers	☐	☐	☐
Alternative and Augmentative Communication	☐	☐	☐
Articulation	☐	☐	☐
Constructivism	☐	☐	☐
Decoding	☐	☐	☐
Differentiated Instruction	☐	☐	☐
Disfluency	☐	☐	☐
Expressive Language	☐	☐	☐
Homogeneous groupings	☐	☐	☐
Inclusion	☐	☐	☐
Individualized Program Plan (IPP)	☐	☐	☐
Learning Disability	☐	☐	☐
Metalinguistic Awareness	☐	☐	☐
Narratives	☐	☐	☐
Pedagogy	☐	☐	☐
Phonics	☐	☐	☐
Phonology	☐	☐	☐
Pragmatics	☐	☐	☐
Program of Studies	☐	☐	☐
Receptive Language	☐	☐	☐

9. Explain to a parent the role and process of **assessment** in your profession.

10. Explain to a parent the connection between spoken language (i.e. speech and language) and reading/writing?

11. Sheila is a speech-language pathologist who has been assigned to provide support to Janine's classroom. Janine's classroom is inclusive and therefore has students with varying abilities and a few with special needs. Explain to Sheila and Janine the different ways their professional contributions can be structured to meet student needs.

12. **Interprofessional collaboration** occurs when professionals from different disciplines work together towards common goals. List two **strengths** and two **limitations** of **collaboration.**

Strengths of Collaboration	**Weaknesses of Collaboration**

13. **Interprofessional consultation** occurs when a professional is called upon to provide information from their area of expertise to help guide the decisions of another professional. List two **strengths** and two **limitations** of **consultation**

Strengths of Consultation	**Weaknesses of Consultation**

For questions 14-18, please circle the number that corresponds to your personal reflection on the statement

14. I know how and when to involve other professionals in providing services to school-aged children with exceptional concerns

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

15. I possess all collaborative skills needed to work on an team with other professionals

Strongly	Neutral	Strongly

Disagree				Agree
1	2	3	4	5

16. I am a clear and concise communicator when I am working on professional teams

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

17. I am able to identify discipline-specific terms that would not be known by people outside my discipline

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

18. I am able to define discipline-specific terms for parents in a way they will understand

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

19. I am able to work through conflicts effectively in a team environment

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

20. Identify your areas of strength in collaboration

21. Identify areas where you want to work to improve your skills of collaboration

Appendix A-2
Reflective Survey (post-IPE)

Reflection <u>After</u> Interprofessional Education Experience
SLP-Education Collaboration Project

1. What is the role of a speech-language pathologist within the school system?

2. What is the role of a teacher within the school system?

3. What is the role of a speech-language pathologist in providing services to students with speech and/or language concerns?

4. What is the role of a teacher in providing services to students with speech and/or language concerns?

5. Check all items that are within the range of responsibilities of a speech-language pathologist:
   - ☐ Use technology to enhance communication and learning
   - ☐ Teaching in accordance to the curriculum
   - ☐ Assess and treat stuttering
   - ☐ Provide intervention in the area of articulation or pronunciation of specific sounds
   - ☐ Teach punctuation
   - ☐ Teach spelling
   - ☐ Train social skills
   - ☐ Provide intervention to enhance listening and comprehension of spoken language
   - ☐ Develop speech-sound awareness in spoken language
   - ☐ Teach sound-letter correspondence
   - ☐ Assess academic performance
   - ☐ Assess and teach literacy and pre-literacy skills
   - ☐ Make referrals to other professionals when student display exceptional needs
   - ☐ Tailor academic instruction to match a variety of levels of learning

- ☐ Consistently upgrade professional knowledge through professional development
- ☐ Provide hearing screenings for students
- ☐ Teach formal writing such as how to write a business letter
- ☐ Encourage students to think about their language and how they are using language
- ☐ Expand and develop memory for auditory input
- ☐ Assess and provide intervention for feeding and swallowing disorders

6. Check all items that are within the range of responsibilities of a teacher:
   - ☐ Use technology to enhance communication and learning
   - ☐ Teaching in accordance to the curriculum
   - ☐ Assess and treat stuttering
   - ☐ Provide intervention in the area of articulation or pronunciation of specific sounds
   - ☐ Teach punctuation
   - ☐ Teach spelling
   - ☐ Train social skills
   - ☐ Provide intervention to enhance listening and comprehension of spoken language
   - ☐ Develop speech-sound awareness in spoken language
   - ☐ Teach sound-letter correspondence
   - ☐ Assess academic performance
   - ☐ Assess and teach literacy and pre-literacy skills
   - ☐ Make referrals to other professionals when student display exceptional needs
   - ☐ Tailor academic instruction to match a variety of levels of learning
   - ☐ Consistently upgrade professional knowledge through professional development
   - ☐ Provide hearing screenings for students
   - ☐ Teach formal writing such as how to write a business letter
   - ☐ Encourage students to think about their language and how they are using language
   - ☐ Expand and develop memory for auditory input
   - ☐ Assess and provide intervention for feeding and swallowing disorders

7. Categorize the following words using the categories:
   - A teacher would know & understand this word
   - A speech-language pathologist would know & understand this word
   - Both a teacher and a speech-language pathologist would know and understand this word.

	Teachers would know this word	SLPs would know this word	Both teachers and SLPs would know this word
Advanced organizers	☐	☐	☐
Alternative and Augmentative Communication	☐	☐	☐
Articulation	☐	☐	☐
Constructivism	☐	☐	☐
Decoding	☐	☐	☐
Differentiated Instruction	☐	☐	☐
Disfluency	☐	☐	☐
Expressive Language	☐	☐	☐
Homogeneous groupings	☐	☐	☐
Inclusion	☐	☐	☐
Individualized Program Plan (IPP)	☐	☐	☐
Learning Disability	☐	☐	☐
Metalinguistic Awareness	☐	☐	☐
Narratives	☐	☐	☐
Pedagogy	☐	☐	☐
Phonics	☐	☐	☐
Phonology	☐	☐	☐
Pragmatics	☐	☐	☐
Program of Studies	☐	☐	☐
Receptive Language	☐	☐	☐

8. Explain to a parent the role and process of **assessment** in your profession.

9. Explain to a parent the connection between spoken language (i.e. speech and language) and reading/writing?

10. Sheila is a speech-language pathologist who has been assigned to provide support to Janine's classroom. Janine's classroom is inclusive and therefore has students with varying abilities and a few with special needs. Explain to Sheila and Janine the different ways their professional contributions can be structured to meet student needs.

11. **Interprofessional collaboration** occurs when professionals from different disciplines work together towards common goals. List two **strengths** and two **limitations** of **collaboration.**

Strengths of Collaboration	**Weaknesses of Collaboration**

12. **Interprofessional consultation** occurs when a professional is called upon to provide information from their area of expertise to help guide the decisions of another professional. List two **strengths** and two **limitations** of **consultation**

Strengths of Consultation	**Weaknesses of Consultation**

For questions 13-14 please circle the number that corresponds to your personal reflection on the statement

13. I know how and when to involve other professionals in school-aged children with exceptional concerns

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

14. I possess all collaborative skills needed to work on an team with other professionals

Strongly disagree		Neutral		Strongly Agree
1	2	3	4	5

15. Identify your areas of strength in collaboration

16. Identify areas where you want to work to improve your skills of collaboration

For questions 17 – 19, reflect upon the interprofessional collaboration experience you have recently completed

17. I used vocabulary that all my colleagues understood

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

18. If I used a term my colleagues did not understand, I could define the term using words they could understand

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

For questions 19 – 24, reflect upon the interprofessional collaboration experience you have recently completed and rate yourself and your colleagues on the following collaborative skill areas using the scale below:

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

	Collaborative Skill	**Self**
19.	Is a clear and concise communicator in team environments	1 2 3 4 5
20.	Is able to identify discipline specific terms	1 2 3 4 5
21.	Is able to define discipline specific terms	1 2 3 4 5
22.	Communicated in a way that invited input	1 2 3 4 5
23.	Accepted input from all team members	1 2 3 4 5
24.	Is able to work through conflicts effectively	1 2 3 4 5

Appendix B-1
Outline of Interactive Seminar

Session 1 (Lecture & Group activities) (120min)

1. Administrative Information (3 min)
    - Format and outline of session 1
        - o We will be working through 8 challenges today either as a large group, in small groups or in pairs
        - o Short information sections throughout but main purpose is to interact
        - o One break about half-way through for bathroom
    - Information on the collaborative project that will be completed in session 2
        - o Expectations (components to be completed)
        - o Groups (assigned or self selected)
        - o Deadline (end of session 2)
2. History (2 min)
    - The Roots of Education
        - o In Ancient Sumeria (southern Mesopotamia), the first formal education system was established. The primary purpose of Sumerian schools was to teach the elite/affluent grammar and to practice writing
        - o In Ancient Egypt, the scribes were the 'educated elite' and they studied the hieroglyphic system of record keeping
        - o In Ancient India, schools were established around maintaining the verbal tradition of the Veda (hymns, incantations, etc) and grammar, pronunciation, composition, etc of the language were taught (among logic, science, and the secrets of nature)
        - o In Ancient China, schools taught Six Arts: rites, music, archery, charioteering, calligraphy and mathematics
        - o In Ancient Greece, schools were specialized in certain areas and while some specialized in gymnastics (athletics), others in music, there were schools that specialized solely on literacy.
        - o Conclusion: There was always a linguistic component to the birth of schools (the demands of language – oral and written – drove forward the education system)
    - The Roots of Speech Pathology (www.acsu.buffalo.edu/~duchan)

- The elocution movement in the 19th century – 'speech teachers' worked with individuals whose way of life was speaking (e.g. politicians, actors, preachers, etc)
- Elocution became part of the curriculum of public schools thus leading to a need for 'elocutionary teachers) in the 19th century (around the time of the Civil War)
- Andrew Comstock was a doctor and an elocutionist who worked with people who stutter ("stammerers") and people who had trouble with articulation and he developed a phonetic alphabet (to make sound-letter correspondence more accurate) *started moving the field of elocution towards disorders
- Alexander Graham Bell – opened a school to improve speech of deaf, stuttering, and articulation (Vocal Physiology) -> wanted to teach the deaf oral communication
- Became a professional field and then specialized into university programs

- Conclusion: Language gave a purpose for the first Education systems and then from Education, Language-Therapy Field emerged

3. **Challenge #1 (10 min): Outline what your professional role would be in the education system.**
   - **Who do you work with?**
   - **What do you do?**
   - Get one group of SLPs/Teachers to read aloud their role in the school system (type onto the projection), have other groups add and alter
   - Repeat for roles in speech therapy

4. Inclusion (5 min)
   - Imagine a land where there are a group of children who were sent to an island because they required specialized help. Recently, their parents decided they want their kids to spend time with kids on the mainland and so the kids were moved from the island back to the mainland. (INCLUSION MOVEMENT)
     - Brought students with special needs into the regular classroom
     - Need to consult with specialists identified
   - The people with the special skills and knowledge (SLPs) stayed on the island
     - Ask to brainstorm who these may be

- Consultative model: When we put the children with special needs onto a limited number of boats to visit the islands they need for extra help.

5. **Challenge #2 (20min): Which children do you send on a boat to receive services? Which children are the greatest concerns to you and whom do you think SLPs can help?**
   - Groups of students will be presented with a list of descriptions of students who may or may not require speech services. Groups must prioritize the list to fit onto a limited number of boats. *There are 15 students and you have space to take 5 students to the island (i.e. 5 boats that can each fit one student)*
     - Child with Autism
     - Child with Language-Learning Disability
     - Child who stutters
     - Child who mispronounces 'r'
     - Child who hates reading
     - Child who gets into fights on the playground
     - Child with ADHD to is constantly goofing off in class
     - Child with Cerebral Palsy in a wheelchair who does not speak
     - Child who is always zoned out
     - Child who never speaks in class
     - Child who has no friends
     - Child with extreme anxiety
     - Child who runs away from school
     - Child who is non-verbal (selectively mute)
     - Child who is gifted and precocious learner
   - Discussion should evolve around the role of an SLP, the needs in the classroom, and what speech therapy can do to help
   - Go through five-ten cases and have students who chose to keep or leave the child state their rationale for the entire class
     - e.g. "Who decided to take the child with Autism on the boat? [Hands up] Why? Who decided to leave the child with Autism [hands up] why?"

6. **Challenge #3 (5min): Write the strengths and weaknesses of the consultative model**
   - After a couple of minutes have some strengths & weaknesses be called out

7. **Challenge #4 (10min): Analysis of consultative model – how can we fix the weaknesses but maintain some of the strengths?**
    - One of the greatest drawback will be the limited number of children who can receive services (few boats)
    - Solution: Bring the SLPs from the island to the mainland (Collaboration model)

8. Anthropological Perspective
    - Collaboration involves the coming together of two distinct tribes
    - Each has own language, traditions, customs, etc
    - Communication:
        - Develop shared terminology to be able to communicate
        - Relate to the development of a pidgin (linguistic phenomena when two groups encounter each other they develop a basic language that consists of input from both tribes)
    - *Example: decide if they should call the children with speech concerns, 'students' or 'clients' or something else?*

9. **Challenge #5 (20min): SLPs/teachers are coming. You have to give them a tour of your land. What landmarks (jargon) items do you show them and how do you describe to them these things that are only found on your turf?**
    - SLP landmarks (Jargon Words)
        - Alternative and Augmentative Communication
        - Articulation
        - Communication
        - Disfluency
        - Expressive Language
        - Language
        - Metalinguistic Awareness
        - Narratives
        - Phonology
        - Pragmatics
        - Receptive Language
        - Speech
    - Education Landmarks (Jargon Words)
        - Advanced Organizers
        - Constructivism

- Decoding
- Differentiated Instruction
- Homogeneous Groupings
- Inclusion
- Individualized Program Plan (IPP)
- Learning Disability
- Pedagogy
- Phonics
- Program of Studies

10. General Models of Collaboration
    - Multidisciplinary: remain distinct but work with the same individuals
    - Interdisciplinary: work together, roles distinct
    - Transdisciplinary: Integrate and share roles
    - These are akin to potential for long term planning on our mainland-island situation:
        - Multidisciplinary (SLPs will just visit the mainland)
        - Interdisciplinary (SLPs will get high speed boats and spend the week on the mainland but return to the island for the weekends)
        - Transdisciplinary (SLPs will move to the mainland)
        -
11. **Challenge #6 (10min): Decide of the teachers/SLPs long-term solution regarding relocation/visitation to the island**

12. **Challenge #7 (10 min): rank the general models based on:**
    - Feasibility
    - Effectiveness (ideal)

    - Challenge 6 & 7 will conclude together when the teams will provide a quick presentation for another group that outlines their plan for the future and their rationale

13. **Realizing the SLP Role in the Classroom**
    - Possibilities for realization of SLP potential in the classroom
        - Individual/Small Group Pull Out – Speech and language based

- Individual/Small Group Pull Out – supplementing classroom instruction (i.e. follow curriculum and reinforce classroom learning)
- SLP & teacher on the IPP team with family (planning)
- SLP & teacher provide meaningful experiences (guided inquiry) – practical experiences
- SLP will focus on social skills (pragmatics) – work on cooperative group tasks
- SLP works on strategies to scaffold learning with small or large groups (based on achievement level)
- SLP and teacher work on prevention by co-teaching language and learning skills

14. **Challenge #8 (10 min): Edit and modify the other professions role from Challenge #1**
    - Put up the original self-described roles that were outlined originally
    - Ask the opposite profession to comment on the information presented
    - Modify and alter the outline of roles together as a group

15. Conclusion (5 minutes)
    - Conclusions
    - Questions

Appendix B-2

Workbook for Interactive Seminar

Interactive Seminar
Student Workbook

SLP – Education Interprofessional Education Experience
Winter 2011

Instructions:

Use this workbook to guide your learning as we work through the interactive seminar. This is for your own reference and will not be turned in to the IPE experience coordinator or your instructors.

Name	**SLP** ☑	**Education** ☑

Administrative Information

- The Interactive Seminar is **90 minutes** in length
- Next session will be a Collaborative Case Study
    - **Location**: Corbett Hall 2-44
        - Corbett Hall is the brick building located on the west end of Whyte Avenue and 112-114thstreet
    - **Time**: _____ (90 minutes)
    - You will work with students from both disciplines to complete a case study and develop an intervention plan for a classroom using the knowledge and skills of speech-language pathologists and teacher

Challenge #1: Outlining Professional Roles

	Teachers	**SLPs**
Base Role from Literature (from Ukrainetz & Fresquez, 2003)	Instruct in functional and academic skills	Attend to delays and disorders of speech, language, and communication
Amendment 1		
Amendment 2		
Amendment 3		

Notes:

Inclusion Analogy

Imagine a community (schools) located on the shores of the ocean. For years the community sent the children with exceptional needs to live on a small island (specialized services) located about a kilometer off the coast. On that island, the children received assistance and individual help from the residents of the island, (some of which are SLPs). Recently, the community decided they wanted their children to stay as part of the community and live with the other children. The specialists on the island remained on the island, but the children with exceptional needs were now cared for within the community on the mainland (inclusion)

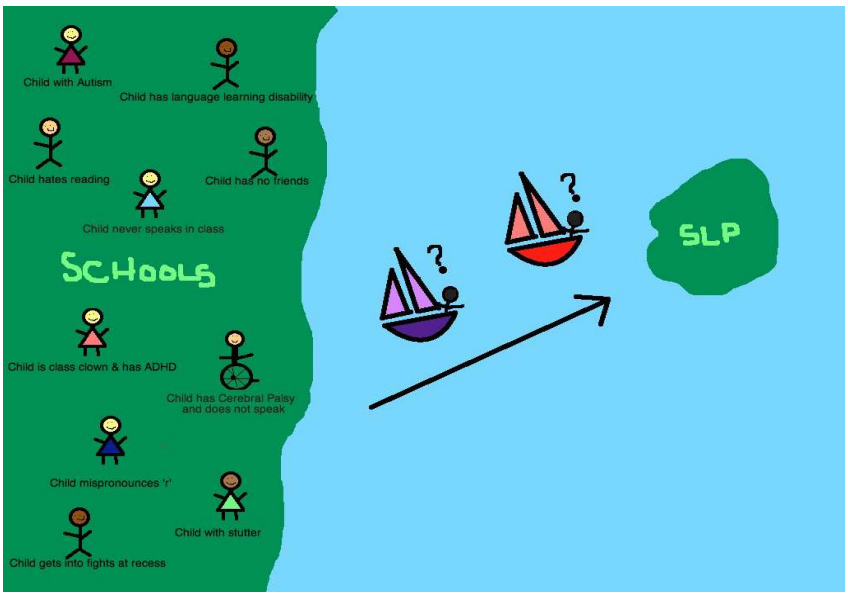
Notes:

Challenge #2: Sending Children to Visit the Island

Some children still need the help of the specialists on the island (SLPs); unfortunately the community only has two single-person boats.

Find a partner from a discipline other than your own and decide together which two students from the list below that you will send to visit the speech-language pathologists on the island:

- Child with Autism
- Child with Language-Learning Disability
- Child who stutters
- Child who mispronounces 'r'
- Child who hates reading
- Child who gets into fights on the playground
- Child with ADHD to is constantly goofing off in class
- Child with Cerebral Palsy in a wheelchair who does not speak
- Child who never speaks in class
- Child who has no friends



Name of Partner		
Boat Number	**Child Description**	**Rationale**
1		
2		
Notes:		

Challenge #3: Analysis of Pull-Out Model

In selecting and sending a certain number of students to visit the island to received specialized services, you just experienced the 'Pull-Out' model of specialized service delivery. In this model, teachers and SLPs work in parallel. SLPs determine intervention goals directly and administer services outside the classroom in areas of articulation, fluency, and voice disorders (Paul, 2007; ASHA, 1999; Elledge, Hasselbeck, Hobek, Combs, Raisor-Becker & Creaghead, 2010)

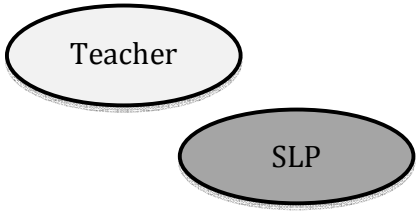
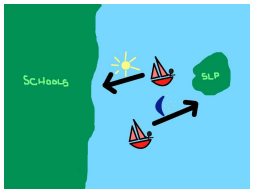
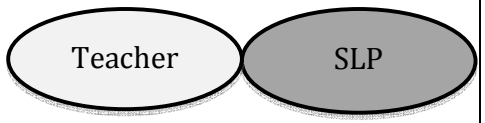
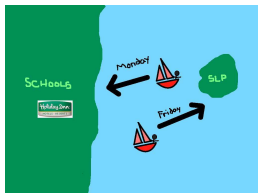
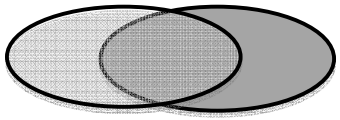
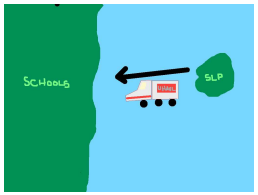
With a partner from the other discipline discuss the strengths and weaknesses of the 'Pull-Out' Model. Use the mainland-island analogy to guide your discussion (e.g. cost of boats – cost of travel for SLPs to travel schools)

Challenge #4: Modifying Pull-Out Model

Brainstorm with your partner some ways you can modify the mainland-island or pull-out model to fix some of the weaknesses (e.g. get fuel efficient boats – Ensure the SLP works in schools that are close to each other and their main office)

Pull out Model		
Strengths	**Weaknesses**	**Modifications for Weaknesses**

Notes:

Models of Collaboration		
Model & Description (Adapted from Buekelman & Mirenda, 2005 and Paul, 2007)	**Diagram** (Adapted from University of Melbourne, 2009)	**Application to Mainland-Island Analogy** (Try to think of your own analogy before you take a peek at mine)
Multidisciplinary –While every team member works with the same individuals, they remain distinct. There is little to no communication between team members.		SLPs get high speed boats and visit the mainland daily 
Interdisciplinary – Team members communicate and work together, however, they each maintain their specialized role. Usually the case is overseen by one team member (the 'case manager')		SLPs visit the mainland for the week and return to their island on the weekend 
Transdisciplinary - Team members are comfortable working in all roles of the team and learn skills that are not specific to their profession or specialty.		SLPs move to the mainland 
Notes:		

Challenge # 5 – Determine Service Delivery Model

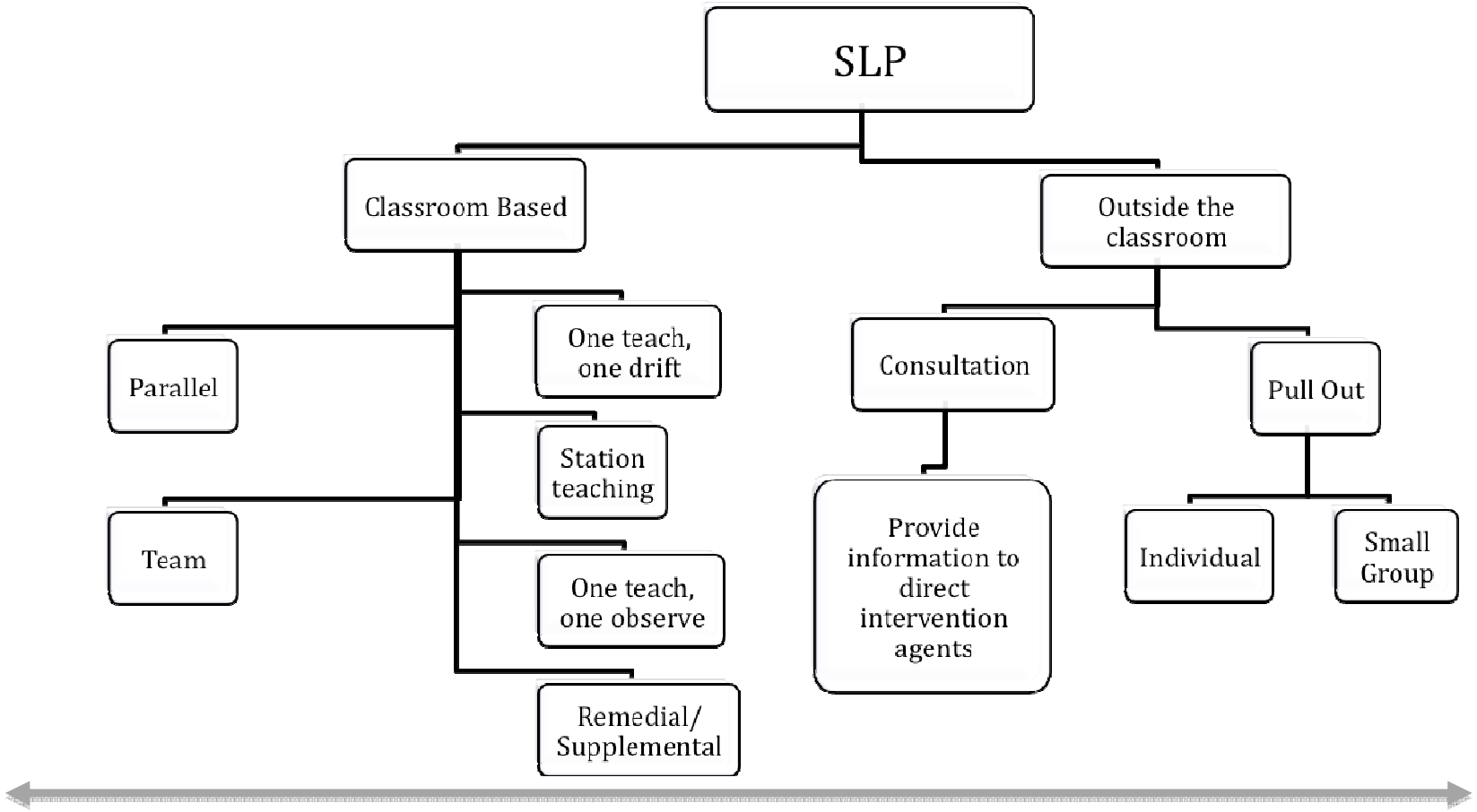
With a partner from the other discipline discuss the strengths and weaknesses of each of the models and decide which model you would like to use.

If you have time: apply what you know about Multidisciplinary, Interdisciplinary and Transdisciplinary teams and develop your own analogy for the mainland-island analogy. For example: I thought an analogy of the Interdisciplinary model could be having the SLP's stay at a hotel on the mainland for the duration of the week. Can you think of another analogy?

Model (Check the one you decide to use)	**Strengths**	**Weaknesses**	**Other Analogies** (if you have time)
Multidisciplinary ☐			
Interdisciplinary ☐			
Transdisciplinary ☐			

Realizing Roles in an Inclusive Classroom

There are many ways that SLPs and teachers can work together to provide intervention for students with exceptional concerns.



Transdisciplinary	Interdisciplinary	Multidisciplinary

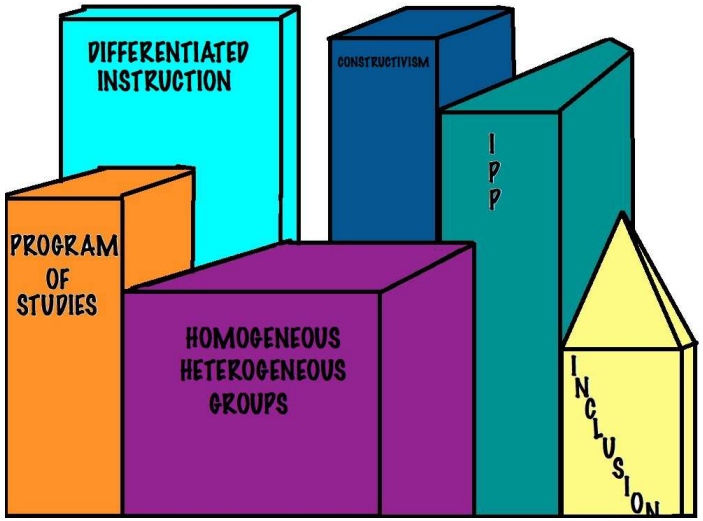
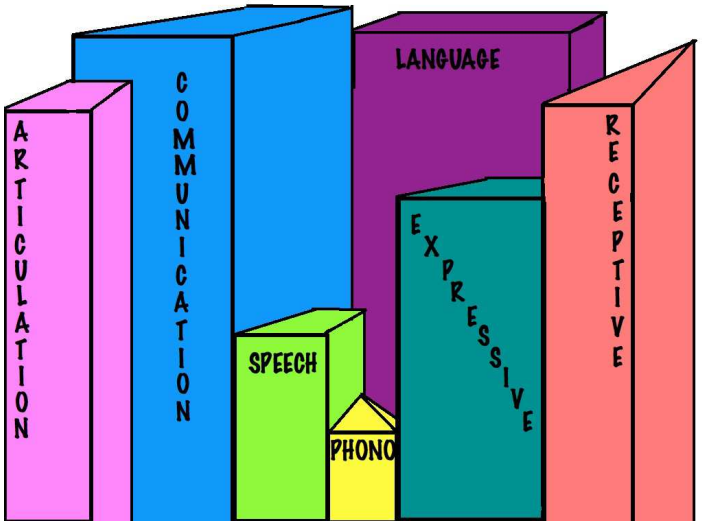
Anthropological Perspective

The mainlanders (teachers) and the islanders (SLPs) are two distinct tribes. Each tribe has it's own language, traditions, and customs. When two tribes come together one of the most difficult things for them to achieve is an efficient and effective form of communication. To do this they have to be aware of the words they use that are distinct to their own tribe, explain these words to members of the other tribe and develop a shared vocabulary that can be used by both tribes.

Notes:

Challenge #6: Turf Tours

The Teacher & SLP tribes have decided to visit each other's lands. When the other tribe arrives on your turf, you will take them on a tour of all the vocabulary landmarks that exist in your land. You must decide which landmarks are exclusive to your turf, and explain the importance of the landmark to your community (i.e. schools, speech-language therapy).

Mainland Landmarks (Education Terminology)	Island Landmarks (SLP Terminology)
	

Mainland Landmarks (Education Terminology)	Island Landmarks (SLP Terminology)
Constructivism	**Communication**
Differentiated Instruction	**Speech**
Heterogeneous Groups	**Language**
Homogeneous Groups	**Articulation**
Inclusion	**Phonology**
Individualized Program Plan (IPP)	**Expressive Language**
Program of Studies	**Receptive Language**

Resources Used to create IPE Workbook

ASHA: American Speech-Language-Hearing Association Ad Hoc Committee on the Roles and Responsibilities of the School-Based Speech-Language Pathologist. *(1999).* Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist. Rockville.

Elledge, D., Hasselbeck, E., Hobe, A., Combs, S., Raiser-Becker, L., & Creaghead, N. (2010). Perspectives on preparing graduate students to provide educationally relevant services in schools. *Perspectives on School-Based Issues, 11*(2), 40-49.

*Flynn, P. (2010). New Service Delivery Models: Connecting SLPs with Teachers and Curriculum. *The ASHA Leader*, August 31, 2010 Feature. Available from: http://www.asha.org/Publications/leader/2010/100831/Service-Delivery-Models.htm

Paul, R. (2007). *Language disorders from infancy through adolescence: Assessment and Intervention (Third Edition).* St. Louis: Mosby Elsevier.

Ukrainetz, T. A., & Fresquez, E. F. (2003). "What isn't language?": A qualitative study of the role of the school speech-language pathologist. *Language, Speech, & Hearing Services in Schools, 34*(4), 284-298.

University of Melbourne – Sustainable Society Institute. (2009). *What is Interdisciplinary Research?* Available from: http://www.sustainable.unimelb.edu.au/content/pages/what-interdisciplinary-research.

*Diagram on Page 6 of workbook is derived from this resource.

Appendix C
Collaborative Case Study

Collaborative Project

SLP – Education Interprofessional Education Experience
Winter 2011

Instructions:

In your small groups of pre-professional teachers and speech-language pathologists, you will decide upon an intervention plan for a classroom.

Fill out the 'Intervention Guide' found in this package to document your plan and guide your discussions.

Your group has about 80 minutes to complete this project.

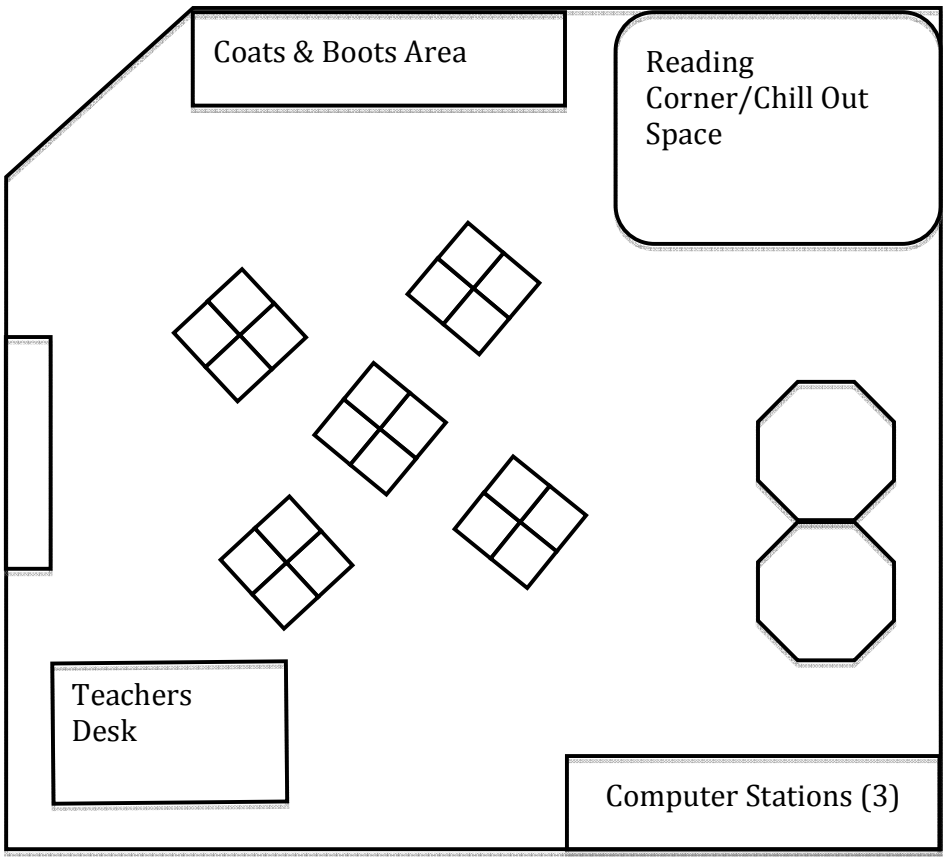
Name of Group Member	**SLP** ☑	**Education** ☑	

Classroom Description

Step 1: Review the case study (10 - 15 minutes)

Grade 2 Inclusive Classroom

- 1 Teacher
- 1 Educational Assistant
- 20 Students



School Description

- Seaside School is located in the heart of the a city similar to Edmonton
- The school population is very diverse but the majority of the students come from working families
- The school has 20 classrooms and 426 students
- The school has some shared spaces, however most spaces are booked in advance
    - Library
    - Resource Room
    - Detention Room
    - Staff Room & adjacent staff workroom
    - Art Room
    - Gym

Description of Students

There are 20 students in the classroom. Seven students are described here. You may assume that students who are not included in the description are typical learners and do not have speech-language or behavioural concerns.

- James and Colin are twins
    - James has lots of friends in the class. James is outgoing and rambunctious at recess but is pretty good at settling down when its time to do academic work. James has a lisp on /s/ and produces /r/ as /w/.
    - Colin is often seen just following behind his brother on the playground. Colin had severe early language delays and had a lot of trouble learning how to use
    - sounds to make his speech understandable. When Colin and James were younger, James would often translate everything Colin was saying for adults. Colin received speech-language therapy when he was in pre-school for a phonological delay. Today, Colin's speech is clearer, however, when he is nervous or excited he is hard to understand as his speech is mumbled and 'mixed up' as described by his mom. Colin struggles with spelling and does not respond to prompts such as 'sound it out', as he ends up stating syllables instead of individual sounds (for example: "Cat" will be 'sounded out' by Colin as 'C-at' not 'c-a-t').
    - Both Colin and James were late readers. While James is at the lower end of average at the beginning of Grade 2, Colin is reading at an early Grade 1 level.

- Daniel is an eight-year old boy with Autism and currently has an IPP. He often is overwhelmed when the room becomes noisy, and will 'shut down' (i.e. hide in the corner of the room, make odd sounds, etc). Cars fascinate Daniel and he can talk for

hours about engines. Daniel struggles to relate to his peers and his classmates often ignore him or make fun of him for being 'weird'. Daniel is an avid reader and reads early reader 'chapter books'.

- Sophie is a quiet and shy girl who never causes any trouble in the classroom. She always takes her time to complete her work, and often does not complete academic tasks. She will sit in her desk for a long time and often is "spacey".

- Doug has a moderate stutter, and while he seems to have a close circle of friends, Doug reported to his mom last week that he was being picked on by some kids on the playground. Doug never speaks up in class but has no trouble academically.

- Thomas is the class clown. He has a great sense of humour and loves making his peers and the teacher laugh. His favourite class is physical education. He is goofy and has a lot of energy. He can often disrupt the class with his antics especially during independent work time. Doug has an IPP for moderate ADHD. Thomas struggles with sound-letter correspondence.

- Hussein's family just moved to Canada from Pakistan. Neither of his parents is fluent in English, although his father is currently taking English courses at night. Hussein speaks very basic English but is doing Math at a Grade 3 level.

Step 2: Develop an intervention plan (40-45 minutes)

Intervention Guide

Team Goal (What does this team hope to accomplish in this classroom?)				
Plan for Intervention (Establish at least 5 needs and intervention planning for each)				
Need being addressed	**Intervention** What will be done to assist with the identified need?	**Who is implementing the intervention?**	**How is the intervention going to be structured?** Service Delivery Model	**Other Considerations that were discussed/Other Information**
EXAMPLE (not in case study): student has hearing loss & is being bullied	Awareness of hearing loss program for the classroom	SLP & Teacher	Co-teach jointly developed session to the class with information about hearing loss and effective communication	Consent from the student and his family
EXAMPLE 2 (not in case study): Increase enjoyment of literacy for the classroom as shown by student ratings and self-reports	Promote exploration of literacy	SLP & Teacher	Interest groups will be formed and the SLP & Teacher will be responsible for 2 interest groups (station teaching)	Diversity of interest groups Student participation in establishing the interest groups. SLP time/availability

Need being addressed	**Intervention** What will be done to assist with the identified need	**Who is implementing the intervention?**	**How is the intervention going to be structured?** Service Delivery Model	**Other Considerations that were discussed/Other Information**

Step 3: Prepare to explain the Intervention Plan to Parents (15 - 20 minutes)

Preparation for Parent Meeting

Preparation for Meeting with Parents As a team decide how you will explain to Colin & James' mom and dad the intervention plan for **Colin** (Only Colin, not James) ***Please write the exact words and phrasing you would use for the parents***	
Colin's Needs	
Plan to Address Colin's Needs	
Other information for Parents	

Step 4: As a group reflect on your collaboration (10 - 15 minutes)

Group Reflection on Collaboration Process

As a group reflect on these important areas of collaboration and decide upon a group rating. Justify your rating in the space provided						
Area of Collaboration	**1** Strongly Disagree	**2**	**3** Neutral	**4**	**5** Strongly Agree	**Justification of Rating** **Examples** **Other Information**
We communicated clearly and concisely						
We identified and defined discipline specific terms (if applicable)						
We accepted input from all team members						
We worked through conflicts effectively (if applicable)						
Our team worked together effectively and efficiently (Overall rating)						

Appendix D
Informed Consent & Information Sheets

INFORMATION SHEET for STUDENTS

Constructing Collaboration Across Campus: Pre-professional speech-language pathologists and teachers working together

Salima Suleman, Lu-Anne McFarlane, Dr. Karen Pollock

January 22, 2011

Background

We are providing pre-professional speech-language pathologists and teachers the opportunity to take part in an interprofessional education experience. Students from both disciplines will be completing an interprofessional education experience as part of selected courses in the Department of Speech Pathology and Audiology and the Department of Elementary Education in the Winter 2011 academic semester.

Purpose of study

The purpose of this study is to collect evidence regarding the effectiveness of an interprofessional education (IPE) experience for pre-professional speech-language pathologists (SLPs) and teachers. It is designed to give pre-professionals an opportunity to reflect on their own knowledge and skills in general regarding collaboration and specific to the SLP-teacher interaction. You will have an opportunity to interact with students from the other discipline and work together to complete a collaborative case study.

SLPs and teachers bring unique skills in the domains of speech, language, communication and literacy and work with the same population of students. In schools, there are changes taking place that are asking SLPs and teachers to work together. Interprofessional education is the way in which post-secondary institutions can prepare their graduates for collaboration in the workplace.

Procedures

All pre-professionals registered in identified courses will take part in the IPE experience, which will consist of two online reflective surveys, an interactive seminar, and a collaborative case study that will be completed in small interprofessional groups. You have the option to agree to have your responses on the surveys and your contributions to the collaborative case study be used for research purposes to determine the effectiveness of the IPE experience. You also have the option of indicating that in the future, you would be interested in participating in more research related to the IPE experience, such as a focus group.

If you agree to participate in the study, you will hand in the attached consent document and the biographical information form to a secure box in your department office.

Benefits

There are potential benefits to your participation. Your reflections on your knowledge and skills in the area of interprofessional collaboration and your contributions to an interdisciplinary group will provide valuable information related to the effectiveness of the IPE experience.

Risks

There are no known risks to participating in this study. Participation in this study will **not** affect your course grade.

Voluntary participation
Your decision to participate is entirely voluntary. You can withdraw at any time. Your decision to participate in this study has no effect on your grades.

Confidentiality
Only a unique code number will identify all of the written materials associated with the study. Photocopies of any materials used for research will be taken and the original unaltered documents will be available to your professors for their reference. Your course instructor will not know if you consent to participate in this research project and participation in the research will not affect your course grade.

Contact Information
Please contact us if you have any questions or concerns. If you have concerns about your rights as part of this study, you may contact the Health Research Ethics Board (HREB) at (780) 492-0302.

Sincerely,

Salima Suleman
Graduate Student
Department of Speech-Pathology and Audiology
Phone: (780) 492-5907
Email: suleman@ualberta.ca

Lu-Anne McFarlane
Associate Professor
Academic Coordinator of Clinical Education
Department of Speech-Pathology and Audiology
Phone: (780) 492-5907
Email: luanne.mcfarlane@ualberta.ca

Dr. Karen Pollock
Professor and Chair
Department of Speech-Pathology and Audiology
Phone: (780) 492-5980
Email: karen.pollock@ualberta.ca

CONSENT FORM

Part 1 (to be completed by the Principal Investigator):

Title of Project: Constructing Collaboration Across Campus

Principal Investigator(s): Salima Suleman **Phone Number:** 780-492-5907

Co-Investigator(s):	**Contact Names:**	**Phone Number(s):**
	Lu-Anne McFarlane	780-492-5907
	Dr. Karen Pollock	780-492-5980

Part 2 (to be completed by the research subject):

	Yes	No
Do you understand that you have been asked to be in a research study?	☐	☐
Have you read and received a copy of the attached Information Sheet?	☐	☐
Do you understand the benefits and risks involved in taking part in this research study?	☐	☐
Have you had an opportunity to ask questions and discuss this study?	☐	☐
Do you understand that you are free to withdraw from the study at any time, without having to give a reason and without affecting your future education?	☐	☐
Has the issue of confidentiality been explained to you?	☐	☐
Do you understand who will have access to your records?	☐	☐

Who explained this study to you? _____

I agree to take part in this study: ☐ Yes ☐ No

I agree to have my responses used in future research: ☐ Yes ☐ No

I would be interested in taking part in future research related to the IPE experience (such as a focus group):
☐ Yes ☐ No
If yes, please provide your e-mail address:
_____

Signature of Research Subject _____

(Printed Name) _____

Date:_____

Signature of Investigator or Designee _____ Date _____

***** Please complete information on reverse***

Demographic Information (Please complete)

Age: ____

Gender: ☐ Male ☐ Female

Department:
☐ Speech Pathology and Audiology
☐ Elementary Education
☐ Other: _____

Program of Study
☐ B.Ed
☐ M.Sc. SLP
☐ Other: _____

Year in Program of Study: _____

Specialization (Minor): _____

Number of years you have been enrolled in a post-secondary institution (including this year):
_____

Prior post-secondary degrees awarded: _____

Have you completed any pre-professional practical experiences in your current area of study (i.e. Clinical experience, Introductory Professional Term, Advanced Professional Term, etc)
☐ Yes ☐ No
If Yes, please specify and indicate when you completed the practical experience:
_____
___

_____
___

If you are in the department of elementary education, do you have an interest in pursuing studies in the area of speech-language pathology?
☐ Yes ☐ No

If you are in the department of elementary education, have you taken any courses in Linguistics?
☐ Yes ☐ No
If yes, please specify:
_____

For research use:
Code number for subject:_____

Appendix E
Criteria for Identifying Jargon

Criteria for determining Jargon v. Not-Jargon

1. Both raters agree the word or phrase is discipline specific
2. If the phrase was stated in a different way that uses the same words and raters agree the revised phrase is not jargon, then the original phrase is also not jargon (i.e. 'language sample' -- 'sample of language')
3. The word is not being used in the way stated in the primary or secondary (i.e. the first or second) definition of the word on Merriam-Webster online dictionary. If it is the primary definition, then it may just be a poor choice of words
4. The word or phrase appears in the glossary or index of general introductory SLP/Education textbook
5. The word or phrase is being used in conjunction with another word or phrase that results in a phrase that is discipline specific as agreed upon by both raters (example: "formal and informal assessment")
    a. If two or more words are joined by the conjunction "and" - the words are counted as a single phrase (example: "formal and informal assessment" = 1 phrase)
    b. If two or more words are joined by the conjunction "or", etc – the words are counted individually as single words (example: "formal or informal assessment" = 2 words)
6. If a jargon word is used multiple times
    a. If it is defined initially, subsequent uses of the word is not counted as jargon
    b. If it is not defined initially, subsequent uses of the word are counted as jargon

Appendix F
Coding Structure – Personal Strengths and Weaknesses in Collaboration

Competency	Communication	Collaboration	Role Clarification	Reflection
Definition	Communication skills that enhance Interprofessional team function	Interprofessional team process skills that achieve common goals	Understanding of own role and the roles of others in an Interprofessional context	Critical evaluation of professional and team practice in an Interprofessional context
Areas (from transcripts & HSERC Framework)	Communication • Written • Verbal explanations • Discipline specific Assertiveness/confidence Listening Conflict management and resolution Seek clarification Stay on topic	Participation Encourages others to participate Flexibility/Adaptability in decision making Decision making Open-minded Taking all opinions into consideration (deliberation/induction) Respect Patience Conversation management and dominance avoidance Personality factors (friendliness) Flexibility in control of group	Understanding own and other professional roles Advocating for roles Advocating for clients Providing specialized knowledge Professional perspective taking Roles within teams (leadership roles, etc)	Skills in the area of reflection Enjoyment of reflection
Examples from Transcripts	"speaking concisely and clearly" "I would like to be more assertive" "think about other ways to express myself" "Define discipline-specific words, and being aware of which words other professional may think they know" "I should have brought a list of discipline-specific terms to help express myself in a clearer way"	"ensuring everyone has a chance to speak" "I value their opinion" "compensate for controlling group members" "thorough - I like to take my time" "open to input" "organized"	"not afraid to take a leadership role" "Understand their needs and goals in relation to the client" "Interested in learning about other professions"	"I like to look ahead and into the future"

Appendix G
Coding Structure – Professional Roles

Domain	Code	Define Code	Sub-Codes	Key Words from Transcripts	Example from Transcript
Target Population (Who)	Student	Reference to or Implied provision of services to a subset of students with suspected or identified needs (example: "Can work one and one with children in small groups. . .") Reference to the individual needs of all students (example: "differentiated instruction")	S - Speech	Speaking, Verbal/Oral, Stutter, Pronunciation Speech Impediments	"To assess and treat children with speech and language disorders"
			L - Language	Expressive, Receptive, Syntax, Semantics	"Address individual needs regarding speech and language difficulties"
			C - Communication		"To help those who have difficulty with verbal communication"
			Lit - Literacy	Reading	"To provide strategies of language and literacy"
			Social/Classroom Skills	Pragmatics	"teach the children age appropriate skills, such as turn taking, listening skills. . . "
			H - Hearing		"Screening of certain problems (hearing)"
			ELL - English Language Learners		
			Sw - Swallowing		
			A - Academic	Curriculum	"Instruct students and help them acquire new knowledge, based on the curriculum objectives set for each province"
	Classroom	Reference to modifications to a classroom or providing services to a large group (class) of students	E – Environment		"Make classroom a language rich environment"
			M - Management		"He/She may be a referee at times" "Ensure students have a safe environment"
Specific Role with Population (What)	Ax	Reference to assessment & diagnosis, tracking progress or reporting progress		Assessment Diagnosis Reporting	"determine whether or not the child has a speech difficulty" "Identify why/what problem

				Provide Feedback	students are experiencing" "provide feedback"
	Tx	Providing direct treatment or intervention		Work with + population	"help the students" "assist children to. . improve . . skills"
	Screen	Measures taken before 'assessment' to identify potential candidates for further assessment			"Do screening of certain problems – hearing & phonological" "If a child is struggling . . . identify the child"
	Advocate	Promote access to services			"Advocate for teaching practices"
	Refer	Refer individuals for additional assessments by other professionals			"Refer the child on to any additional services"
	Prevent	Taking preventative measures		At risk, prevent later problems	"Identify and work with children that are at risk for later problems"
	Facilitate	Reference to indirectly affecting change. Emphasis on *student* accomplishment and professional providing support to students	Learning Development Decision making Treatment/Therapy + consult = training another professional to carry out treatment	Help, develop, provide opportunities, facilitate, support,	"provide experience" "provide resources" "help students grow and develop" "provide an opportunity to learn"
	Mentor	Reference to positive relationship building with students and acting as a role model		Mentor, role model	"Empower students to make responsible and smart choices in their daily lives . . . "
	Teach	Reference to directly teaching	Academic - curriculum Social Skills Language	Teach, educate, curriculum	"Present information" "Provide education"
	Adapt	Reference to modifying teaching to meet the individual needs of students. Implementing strategies recommended by another professional		Modify, specialize, individualize, differentiated instruction	"Implement strategies to help the child in the classroom"

	Tx Planning	Reference to planning treatment without implementing the treatment. Note: does not refer to planning of specific sessions or lessons. Reference to overall treatment planning (i.e. goal setting)			"Develop individual programming and goals"
Expectations for Results (Why)	Functional Outcome	Improve Function in the classroom, at home, etc Reference to real life application		Outside of school, citizens, society, peparation for adulthood	"Help children to be ready to participate in classroom activities" "help them [students] become active thinking citizens"
Method of Service Delivery (How)	Consult	Reference consultation and uni-directional flow of information (i.e. one professional provides information to another	T – Teacher P – Parent OP – Other Professional	Educate, Provide resources, Inservices , help	"Prescribe activities" (314) "Support to teacher" "Provide resources" (130) "Communicate with" "Primary point of contact"
	Collaborate	Reference to working together and sharing responsibility for delivery of services		Work together	"Work together with teacher, teaching assistants, and principal" (140)
	Seek Consult	Reference to seeking out outside sources of information	SLP OP – other professional		"Find appropriate resources"
	Transdisciplinary	Reference to a method of service delivery with 'role release'			"Teacher & SLP teach"
	Mixed (SD)	Mentions more than one of consultation, collaboration, or transdisciplinary approach to service delivery			
Location of Service Delivery (Where)	In	Reference to classroom based or the delivery of the service physically within the classroom			
	Out	Reference to Pull-Out models of service delivery where service is provided outside the classroom			"Sometimes the SLP will pull the child out of their classroom in order to do a therapy session"
	Mixed (L)	Mention of both services provided within and outside the classroom			"Provide in class and out of class therapy"
Context	Admin	Reference to Administrative		School board, system, Alberta	"Some systems have more

		Structure, Alberta Learning or Provincial regulations		Program of Studies, Alberta Learning, Provincial Regulations	emphasis on . . .”
Other	Professional Development	Reference to ongoing education and maintaining current professional understanding			“Continuously working on professional development”
	Extracurricular	Reference to supervisory duties such as playground supervision, coaching sport teams, etc			“Volunteer to do extra activities with students outside of school hours (ex. Be the coach of a volleyball team”

Appendix H
Full list of Jargon Words As Determined by Criteria (Appendix G)

Jargon	Not Jargon
• Articulation • Chronological + (age) • Criterion Referenced • ***Decode*** • ***Developmentally + (appropriate/functioning)*** • **Differentiated Instruction** • Domains + (language) • Fine Motor • Fluency • ***Formal & Informal*** • **Formative & Summative** • Forms + (Grammatical) • Graphemes • Intelligible • **Metacognitively** • Modalities + (language) • Morphology • Narrative Sample • Normal Curve • Normal Distribution • Normal Range • Norms • Operating + (__) • Oral Language • Orthography • Output + (Motor) • Phonemes • Phonemic • ***Phonetic*** • Phonological Awareness • Phonology • **Portfolios** • Pragmatics • Pre-Literacy • Pre-Post Treatment Measure • Probes • Profile + (language) • **Program of Studies**	• Adaptation/Modification • Baseline • Clinical Observation • Cognitive • Communication + (formal) • Comprehend • Content • Correspond • Discharge • Function + (level of) • Generation • Grade Standards • Impairment • Input/Output • Instructional Level • Intervention • Language • Language Arts • Language Sample • Late-Talkers • Linguistic • Multimodal • Operating • Oral + (sounds) • Outcome • Programming • Reading Comprehension • Representation + (visual) • Respiratory • Screening • Significantly • Speech muscles • Speech Sample • Structure + (formal) • Verbal/Non Verbal

• ***Receptive & Expressive*** • **Registers** • Representations + (__) • Resonance • Segmenting + (sounds) • Semantics • Sight Words • Significant Difference • Sound-Letter Association • Sound-Letter Correspondence • Sound Segments • Standard Deviation • Standard Scores • Standardized Test • Typical + (range, etc) • Within Normal Limits	

***bold** terms were used by Education participants
****bold & italicized*** terms were used by both SLP and Education participants

Appendix I
Coding Structure –Service Delivery

General Models	Application of Models	Examples
Multidisiplinary (**Multi**) • Same population • No communication between SLPs and Teachers • Distinct roles and responsibilities	Pull Out	"Work separately with the children" "[Teacher] should be differentiating her teaching . . .while [SLP] should be focusing on specific students"
Consultation • Indicates one-way transfer of information • One professional is the expert providing information to the other		"[SLP] can also help to provide [teacher] with activities she can do in the class that can help a variety of students"
Interdisciplinary (**Inter**) • Same population • Communication between SLPs & Teachers (2-way communication) • Distinct roles and responsibilities	One teach, One drift (**1-D**) One teach, One observe (**1-O**) Station (**St**) Remedial – Re-teach (**R**) Supplemental – Re-teach with new info (**Sup**)	"Each provides useful information to the other and collaborate to enhance the students experience and address their needs"
Transdisciplinary (**Trans**) • Same population • Communication between SLPs & Teachers (2-way communication) • Overlapping and shared roles and responsibilities	Parallel (**P**) Team or Co-teach (**T**)	"They can have classes where they teach together in the classroom based on the students needs"

*Inferred General Models marked by ( )
**If an Application associated with a General Model was described, the General Model was inferred

Appendix J
Coding Structure – Strengths & Weaknesses of Models of Service Delivery

Code (+/-)	Sub-Code (Strength)	Strength	Sub Code (Weakness)	Weakness
Time		Efficient use of time		Time consuming Inefficient use of time
			Schedule	Trouble with scheduling
Perspectives **Views**	**New**	New and different perspectives	**Different**	Conflict due to difference of opinions
	Knowledge	Professional knowledge and expertise	**Ltd**	Individuals may have limited views or knowledge Incorrect knowledge may be transferred Lacking specific knowledge about a case
Location		Shared space Same resources		Not own space Have to bring resources Being in different physical locations
	Cross-Enviro	Consistency across environments Observe change across environments		
	Specialized	Special environment to support learning		
Communication **Com**		Rich discussions Communication with other professionals		Miscommunications Unclear communication
Interpersonal **IntP**		People work well together Collaborate and support each other	**Conflicts**	Can be personal or unspecified
			Resist	Resistance to collaboration, changing views, communication, etc. An unwillingness
Effectiveness of Service	**Breadth**	Address the needs of lots of students	**Qual -**	Poor quality of service

Delivery **SD**	**Depth**	Provide high quality service to individuals		
Cost		Cost effective (cheaper)		Expensive (costly)
Professional Roles **Roles**	**Share**	Shared roles and responsibilities Common goal	**No Share**	When professionals remain distinct and don't share roles and responsibilities
	↓Work	Decreased workload per professional		
	Resources	Exchange of discipline specific resources (physical and knowledge resources)	**Clarity**	Blurring of roles Unsure of other's roles
	↑Aware	Increased awareness of different roles	**↓ Awareness**	Lack of awareness of the others or own professional roles/responsibilities
Other			**Social**	Negative social implications for children Consulting clinician doesn't know the children

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