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The Potential of Modelling Co-Teaching in Pre-Service Education

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Abstract

Two studies aimed to document the process of preparing for and teaching collaborative education courses and to determine students' perception of collaboration and inclusion as a result of taking the course. Two sessions of collaborative teaching run by different professor dyads were studied over two 10-week quarters at a large public university. Multiple sources of data were collected. Ultimately, modelling collaboration and a positive attitude toward disability, collaboration, and inclusion provided professors an opportunity to help guide and shape pre-service teachers' attitudes.

Keywords

Collaboration, Co-Teaching, Disability, Modelling, Pre-Service

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Introduction

Decades-old laws and educational philosophies support inclusive education for students with disabilities. Co-teaching, a model in which general- and special-education teachers collaborate to co-plan, co-assess and deliver instruction together enables students with special learning needs an opportunity to attend classes with their typically developing peers. Despite promise of the practice, research indicates that pre-service educators lack both experiences and coursework that prepare them for professional collaboration and effective service delivery to students of varying abilities (Arndt & Liles 2010; Orr 2009). In an attempt to bridge this gap in teacher education, one university explored the potential gains of co-teaching in a teacher-education program by permitting professors to merge general- and special-education coursework and teach students from their respective programs side by side. This study examines the process of planning and executing the co-taught subjects. The ultimate goal of this paper is to add to the body of literature that examines co-teaching practices in higher education and address the following research questions: How does professors' modelling of co-teaching affect student attitude towards the practice of co-teaching? How do professors' perceived attitudes toward co-teaching affect students in a co-taught subject?

Review of the literature

In-service collaboration in K-12 schools faces difficulties not entirely dissimilar from those found in post-secondary institutions. Research on primary and secondary collaboration shows the challenges of negative attitudes that are rooted in ongoing traditional university teaching methods that neglect the modelling of collaboration and collaborative techniques.

Attitude of in-service teachers

While the literature of the impact of students' pre-service attitudes toward collaboration and inclusion is relatively small compared to those of in-service teachers, research indicates that in-service teachers who are negative or apprehensive toward inclusion may behave in ways that inadvertently exclude children with special needs from learning opportunities (de Boer, Pijl & Minnaert 2011; Gal, Schreur & Engel-Yeger 2012; Sharma, Forlin & Loreman 2008), which is counterproductive to the intended result.

Orr (2009) notes that general educators and administrators tend to hold negative attitudes toward collaboration and inclusion. The issue of negativity was also of note in a study by Fulk and Hirth (1994), as many teachers in their study reported feeling that inclusion was "forced" upon them. To further illustrate the point, only half of sample teachers reported being supportive of including students with special needs in the general-education setting, and one-third stated that they were against inclusion altogether (Fulk & Hirth 1994). Similar findings from Monahan (1996) and Siegel and Moore (1994) found that almost two-thirds of general educators were resistant to inclusion.

Research on attitudes about inclusion and collaboration shows that most concerns raised by in-service teachers stem from feeling that they did not receive adequate preparation in their pre-service program (academic and practical) (Berry 2010; Orr 2009; Sadioglu, Bilgin, Batu & Oksal 2013). These negative findings are of particular importance as researchers report that attitude toward inclusion is just as important as teaching skill and content knowledge in determining

implementation of high-quality inclusive teaching practices for both pre- and, ultimately, in-service teachers (Sharma, Loreman & Forlin 2007).

Post-secondary collaboration

The research on collaboration in primary and secondary teaching shows the challenges of negative attitudes. At the root of the problem, pre- and in-service teachers often lack opportunities to learn about and observe collaboration techniques before they must implement them in their own practice, largely due to the continued use of traditional university teaching methods. Research demonstrates that with specific training in inclusive and collaborative practices, self-efficacy increases, thereby improving attitude and disposition toward these practices (Leysner, Zeiger & Romi 2011).

Pre-service student attitude

The literature suggests that both pre-service general and special educators have concerns and negative attitudes about collaborating and including students with special needs into general-education classes due to a lack of adequate preparation and common professional working knowledge (Adrndt & Liles 2010). Other new teachers' concerns centre on their implementation of a collaboration model: they are "excited about the potential of co-teaching, but [feel] ill prepared to participate" (Orr 2009, p.232) because they have not taken classes or had practical experience in collaboration prior to being hired (Orr 2009). Real or perceived lack of collaboration skill and experience is concerning because a positive attitude toward collaboration is necessary for an effective inclusion program; all educators, regardless of certification, must regard one another as equal participants, with all parties effectively trained and ready to teach all students (Silverman 2007).

It is important to examine attitudinal barriers for pre-service teachers to gain necessary skills and confidence throughout their training programs. Problems include failure to train teachers on collaborative lesson planning, differentiation of instruction and poor attitudes toward inclusion (Brinkmann & Twiford 2012; Burstein, Czech, Kretschmer, Lombardi & Smith 2009). The implications of this research are that, in the wake of changing laws and educational needs, a need exists to examine current practices in pre-service teaching programs that may help determine where changes need to be made to adequately prepare teachers for inclusionary practices, including professional collaboration.

Shared coursework

In an effort to simulate in-service collaboration, creative methods have been used to allow pre-service general- and special-education teachers the opportunity to take subjects together. In a combined or collaborative subject, special and general pre-service hopefuls might be paired to complete assignments, with requirements including both perspectives on the same topic. When people take classes and work together, and do so from the beginning of pre-service training, they may be more likely to foster a mutual respect and learn to draw on each other's strengths in a manner that would ideally continue into professional practice.

Studies show that, once certificated, teachers who have completed coursework aimed at positively changing attitudes and beliefs about inclusive education are more supportive of students with special needs than colleagues who did not receive specialised instruction (Carroll, Forlin & Jobling 2003; Lancaster & Bain 2010). Other studies show that teachers' attitudes can be positively influenced by pre-service and continuing education experiences ranging from a 10-week subject to a nine-month subject (Carroll et al. 2003; Henning & Mitchell 2002). These findings are

encouraging because they show that specialised instruction within both limited and extended time frames can alter beliefs.

Similarly, pre-service and continuing education teachers in general- and special-education programs taking subjects together might foster discussion and respect that may later permeate professional practice. When coursework is merged to the greatest extent possible and teachers have increasing knowledge of inclusionary practices, attitudes are likely to improve (Forlin & Chambers 2011). As a result, new teachers will be prepared to collaborate in an effort to teach all students with varying abilities in their chosen curricular area, and feel competent in doing so.

Professors' attitude

While the body of literature addressing professors' attitudes towards collaboration in their classrooms is relatively small, one study found that post-secondary collaborative teaching has the potential to create stress for professors because the new teaching scenario requires flexibility, logistic challenges of sharing a classroom and an unforeseen increase in time demands (Waters & Burcroff 2007). To further complicate matters, universities may not be prepared to handle the policy shift that must occur to accommodate new models of teaching: methods of evaluation, effect on promotion or tenure and the ability to conveniently schedule classes to suit the needs of two professors rather than one (Graziano & Navarrete 2012; Kluth & Straut, 2003). Such barriers to implementation may be driving hidden and unexamined forces that contribute to professor resistance to changing current pre-service models, which may, in turn, negatively affect their attitude toward using collaboration models.

Professors modeling attitude

Pre-service education provides an opportunity to help shape the attitudes of developing teachers well before they enter their own classroom; this is particularly important as it is suggested that the success of inclusion is dependent on pre-service teachers' positive attitudes (Gökdere 2012; Sharma, Ee & Desai 2003). Multiple studies have found that pre-service teachers who express positive attitudes are more likely to support students with special needs and, once they become in-service teachers, positively influence other students' attitudes towards special-needs children (Douglas, 2014). Like students in K-12 schools, pre-service educators are influenced by their own teachers and coursework (Alghazo, Dodeen & Algaryouti 2003). The attitudes of pre-service and practicing teachers toward students with special needs, combined with the amount of education, experience and academic preparation they receive in teaching students with disabilities, will determine the success of inclusion in the school setting once these teachers have classrooms of their own (Kurniawati, de Boer, Minnaert & Mangunsong 2017; Lancaster & Bain 2010).

Professors modeling collaboration

A very small body of literature exists documenting the perspectives of collaborating professors who come from different departments within education. Hansen and Morrow (2012) discuss how they developed and co-taught a subject for in-service teachers and administrators on the inclusion of children with special needs in general-education classrooms. In reflecting on the teaching of the curriculum over time, the professors noted that their devotion to the subject enabled them to learn one another's material, creating a more fluid class structure that promoted the idea of respect across content areas. They noted that at the end of the subject students were willing to explore concepts previously foreign to them and immerse themselves in the content, perhaps as a result of watching their professors model the same behaviour. These findings affirm Bacharach, Heck and Dahlberg's (2008, p.16) assertion that "co-teaching in teacher preparation programs is a promising practice for fostering collaborating skills". Professors modeling professional collaboration and executing meticulously co-planned and delivered lessons opened the door for students to gain

knowledge about collaboration, communication and co-teaching while accessing academic content from multiple perspectives (Graziano & Navarette 2012). In this post-secondary classroom, knowledge was gained on multiple fronts.

Considering the importance of the role of educator, teacher-preparation programs in a time of shifting roles due to changes in the law and social climate require ongoing examination. In an effort to address these changes, a large public state university (SU) offers collaboratively taught classes across disciplines within the professional-education school (PES). Two studies were prepared with data from two unique collaborative subjects. The goal of this paper is to document the implementation of the collaborative subjects and the resulting effects on the attitudes of the student participants.

Context

SU is located in a large urban centre with approximately 23,000 graduate and undergraduate full- and part-time students. PES is a large division within the university that offers both undergraduate and graduate degrees and certificates in education; it has an enrolment of approximately 1,700 students.

PES offered professors interested in co-teaching graduate and undergraduate subjects across educational disciplines the opportunity to apply for a competitive grant. This opportunity was provided during two different academic quarters during the timeframe of this study. As a result, two studies were conducted, designated Study 1 and Study 2. In both cases, the subjects were created by the registrar ahead of the decision to merge them. Despite the fact that Study 1 and 2 subjects were housed within PES and were recipients of the same funding source, there were contextual differences.

Study 1

Because the registrar created the subjects prior to the decision to merge them, two separate subjects with unique identification numbers were created, resulting in the assignment of different classrooms. The courses were listed in the schedule of classes under different departments within education, with unique classroom assignments, and one name listed as the professor for each subject.

On the first night of class, students enrolled in the special-education (SPE) section found a note on the classroom door indicating a room change. The new classroom for the merged classes was in fact the pre-determined general-education (GE) classroom.

Study 2

Similar to Study 1, Study 2 courses were created by the registrar ahead of the decision to merge the subjects. The GE professor was originally scheduled to teach two sections of the same class, one of which was scheduled for the same night as the SPE class. Due to low enrolment, the GE section that met on the same night as the SPE class was closed. When this was brought to the attention of the collaborating professors, they decided to continue to plan for a collaborative class. They devised an alternative method of bringing students together to facilitate a collaborative teaching experience, asking the students to attend class on nights they would not have otherwise been on campus in addition to their regularly scheduled classes. If students wished, they could attend the other class for the first half of the lecture to experience the collaborative teaching model; the second half of each lecture period would be reserved for subject-specific material. To

introduce and explain the format of the class, the off-night professor attended the first class meeting to introduce herself, jointly explain the schedule and process of joint meetings and welcome students to the joint sessions. In reality, the students would not meet each other until the third week of the quarter, and only then, students who had time in their schedule and wished to attend the joint sessions would do so.

Subjects appeared in the schedule of classes under different departments with only one name listed as the professor. Students enrolled without knowing the collaborative nature of the class.

The participating professors received a stipend for teaching a collaborative subject. All four professors had to teach content specific to their department's academic standards, but the mechanism for doing so differed between the teaching dyads. Study 1 professors had the benefit of meeting together for each class period throughout the quarter. Material was divided between the professors, and the students benefited from having access to two subjects and two expert opinions. Study 2 professors faced scheduling complications that did not allow for such an ideal collaboration. Students and professors had to give up free time to reap the benefits of the collaboration. Material could not be divided and presented as in Study 1; professors had to find overlapping content to present during their joint time while simultaneously preparing for their own unique subjects. As in Study 1, students benefitted from having two professors, but only those who could accommodate the scheduling imposition realised the full advantage.

Method

Participants

Historically, professors Maria and Anne had taught subjects on early childhood development and related topics. Maria and Anne had distinct teaching backgrounds in SPE and GE, respectively. Both Ella and Susan had backgrounds that included teaching children with and without disabilities. Prior to this study, Ella and Susan had co-taught a subject in PES. Table 1 gives the professors' background information.

Table 1. Professors' background information

		Department Affiliation	Years of Tertiary Teaching Experience	Standing
Study 1	Maria	SPE	28	Tenured
	Anne	GE	13	Tenured
Study 2	Ella	SPE	8	Full-time, non-tenure track
	Susan	GE	6	Associate, tenure track

Twenty-three students were originally enrolled in the Study 1 subject and consented to participate; 22 students completed the measures. Twelve participants were enrolled in the SPE section. All SPE participants self-reported more than one year of classroom teaching experience. Of the GE participants, one reported being a teacher, four were assistants, one was both, and four worked in other professions altogether.

Forty-nine students were originally enrolled in the Study 2 subjects; 41 consented to participate in the study. Of those, 29 completed the measures. Thirteen were enrolled in the SPE subject and 16 were seeking secondary GE teaching credentials. Seventeen SPE and 10 GE participants reported some classroom work experience; more than half of the GE participants noted their required classroom observations for this class as experience. Work experience for SPE participants included work as classroom teachers or paraprofessionals, while six GE participants reported some classroom or school-based experience.

Procedure

During the first class meetings, students were given an informed-consent document. They were informed that participation in this study was voluntary and that non-participation would not affect their grade. Consent forms were also given to Study 2 professors during this time.

Once consent was received, data collection began. Student participants completed the post-subject survey on the last night of class. Focus groups were held in the latter half of the quarters. Observations and the collection of electronic and paper documents ran for the duration of the subjects.

Measures

To ensure the credibility of this research, multiple sources of data were analysed to reduce opportunities for researcher bias in a *data triangulation* approach.

Classroom observations

To record observations, the author-researcher took objective and subjective field notes were taken during each three-and-a-half-hour class session in Study 1, and during the initial, final and joint sessions in Study 2 in the form of a running record. Objective observations included the timing and frequency of activities and interactions, along with records of verbatim interactions between professors; subjective notes included the author-researcher's reflections on professor interactions or gestures.

Post-subject survey

In a post-subject survey, participants were asked four open-ended questions that assessed the following topics: "What did you enjoy about taking a co-taught class?" "What did you not like about taking a co-taught class?" "What appeared to be the roles of Professor 1 and Professor 2?" and "Do you have anything else you want to say about your co-taught class? Any advice for the future?"

Student focus groups

In both studies, questions like "What was your first response when you found out that this subject would be co-taught?", "What suggestions would you make to the professors to improve the class?" and "What do you see as some of the strengths of the class?" facilitated the focus groups' discussion.

During the beginning of the sixth class meeting in Study 1, four focus groups of six students each took place. During the beginning of class in Week 8 in Study 2, a focus group session was held during an extended break. The focus group consisted of seven students representing both subjects. Focus groups were held in a room separate from the classroom and out of sight and audible range of the professors.

Document review

For the purposes of the collaborative classes, the professors created a “meta-course” on Moodle, an online virtual learning environment, so that all students had access to the same subject content and communication. Additionally, the professors in Study 2 included the researcher on their email exchanges during the plenary sessions and throughout the quarter.

Professor email interview

At the end of each subject, the professors were asked a short series of open-ended questions via email about their motivation for teaching a collaborative class, whether they thought there were barriers to implementation and how they were paired for this experience.

Analysis

Qualitative measures were used to describe and examine the collaborative teaching efforts and outcomes in Study 1 and 2; these measures resulted in the identification of dominant themes.

Observations in the form of field notes, focus groups and open-ended responses in the post-subject survey were analysed using various content analysis techniques. The four open-ended response questions in the post-subject survey and focus groups were analysed for content by isolating individual statements or phrases from the focus-group transcripts and survey responses and organising them by common ideas pertinent to the research questions. Classroom-observation notes were analysed by noting patterns and themes, and then clustered for counting purposes. Pertinent findings from other data sources, including documents and the professor email interviews from Study 2, were used to provide supporting evidence and more detailed description and explanation for themes emerging from the observations.

Findings

Pertinent findings from multiple data sources were used to provide supporting evidence and more-detailed description for two dominant themes. Theme 1 related to the importance of professors modeling collaboration while co-teaching. Students gained valuable knowledge and insight into the process by witnessing it in teaching, class discussion and group work. Theme 2 related to the infectious nature of perceived attitudes towards collaboration and co-teaching; overwhelmingly, study participants appeared to take on the attitude demonstrated by their professors, as evidenced by their willingness to collaborate in class, deal with administrative complications during the subject and consider the practice for themselves.

Theme 1: Professors’ modelling of collaboration is a lesson to students in and of itself

This paper argues that collaboration skills can be modelled, and therefore taught through direct observation and participation. Studies 1 and 2 provided this opportunity as the professors modelled cooperative lecturing, subject execution and navigation of professional relationships. Furthermore, students potentially had the opportunity to model this behaviour and share their expertise with one another on a regular basis. During the Study 1 focus group, a participant shared her enthusiasm for witnessing the professors modelling of collaboration:

I’ve never experienced two professors teaching at one time.... I was really excited because we keep hearing about this kind of model.... I had to teach with

someone and it was very difficult and I didn't know who I was going to model [my teaching] after.

In Study 2, Ella and Susan exemplified equality in joint sessions and through group communication. Messages written before and throughout the quarter were signed by both professors and addressed to all students. Furthermore, they said “we” to refer to themselves as a teaching unit. In contrast, during the first four weeks in particular, Study 1 professors Maria and Anne often referred to lecture slides as “my slides” or “your slides.” Study 2 professors opened every joint session together and effectively taught the material side by side, or, at the very least, with each other’s professional input. Activities planned and executed by one professor were shared with the other and discussed via email prior to each joint session.

Many GE participants in particular revealed a positive shift in their comfort and beliefs about inclusion and working with SPE colleagues as their professors functioned as role models for collaborative teaching, showing its benefits to students in their own classrooms. A Study 2 focus-group participant pointed out:

This is just like us practising. In the field, all of a sudden it's like we have to collaborate, and it's like I've never collaborated and I don't know what to do. At least now I have some kind of clue and some idea.

Study 2 participants reported via the focus group and open-ended responses on the post-subject survey that Ella and Susan were experts in their respective fields, but also that they “were equal when they taught together”, as they “supported all students”. In contrast, Study 1 participants pointed out the differences and inequalities between Maria and Anne. Week 10 survey responses repeatedly mentioned that Maria functioned as an assistant and Anne was the “lead teacher” who “took more control of the classroom” and “gave most of the lectures”, even though they took the lead for alternate lectures.

During the first class Maria was absent and Anne told students that they should ask questions of “their professor” and attend “their professor’s office hours”; hence, she effectively separated the class into two. Even when Maria and Anne attended together, lectures were largely separate entities, with one professor speaking and the other either sitting or taking notes. Observations of group work revealed increasing pressure and stress as the quarter wore on and students argued about what to present and how to present it, citing differing professor expectations. They did not know how to reconcile these differences for each other while maintaining their own academic integrity. To contribute to the confusion of differing expectations, during Week 8, in Anne’s absence, Maria made due-date changes. Open-ended responses on the post-subject survey indicated a need for clear expectations for all assignments in the syllabus and rubrics. Possibly as a result of Study 1 professor modelling, weekly group work appeared troubled. A student noted on the post-subject survey:

I find it confusing sometimes when [Maria] would explain how to accommodate a student with disabilities and then [Anne] gave her own input, which is the opposite.... One professor was sometimes not aware of how the other professor wanted certain work to be completed.... Assignments were not clear and one

[professor] won't know an answer because the other one created it... They need to collaborate on what they are looking for...it makes it hard for us to work as a group.

In contrast, in Study 2, during the “introduction” classes, students met both professors and learned about the collaborative model using joint sessions. Susan and Ella spoke very freely about the benefits of collaboration and the importance of experiencing both perspectives (SPE and GE). Furthermore, Ella and Susan referred to students as “experts” in either SPE or GE content. The GE students were referred to as “GE colleagues” and the professors regularly used terms such as “our class” and “we” when talking about the subject. Moreover, Ella demonstrated Moodle, which included both course members in one meta-subject, and explained how the two subjects would be integrated online and in person.

Collaborative teaching was modelled in the first and subsequent five joint sessions of Study 2. Frequently professors lectured together, but when one took the lead, the other would take notes on the board, distribute hand-outs, assist with technology or listen and interject comments and suggestions.

At the end of the first joint session in the GE class, Susan thanked the SPE students and asked them to recruit more of their colleagues to the joint sessions. When groups were formed during the second joint session, the professors attempted to mix the groups by saying that students needed to “access each other’s knowledge”. This continued throughout the subject. Hence, a focus group participant commented:

I thought it was neat because, coming from the special-education program, being able to go into the general-education program to get a different point of view allows us to help each other. They gave us some insight and we were able to give them some insight.

This response indicates that Study 2 participants took their professors’ lead, effectively collaborating on projects and expressing gratitude for others’ input and help.

Participant responses from both studies indicate that professor modelling, or lack thereof, had far-reaching effects on attitudes toward each other and professional collaboration.

Theme 2: Professors’ attitudes towards collaboration are passed on to the students

Results from class observations show that attitude plays a large role in how students are educated about professional collaboration and the acceptance of inclusion. Studies 1 and 2 were, in effect, two collaborative subjects with a shared curriculum, but seemingly different goals about teaching collaboration to students. The Study 1 professors’ attitude toward collaborating and disability permeated the subject through comments and anecdotes.

Demonstration of professional collaboration was infused into class. In Week 2, Maria’s lecture slides included both professors’ names on the title slide. In Week 5, after lecture, the professors answered questions together and by Week 6, Maria and Anne walked into class together and lectured side by side for part of the period for the first time. In Week 8, when Maria attended

alone, students brainstormed ideas about accommodating students with disabilities, which Maria uploaded to Moodle for future reference. Participants in focus groups noted:

This sets an example for us.... I like the whole idea because we are learning from their mistakes. We are seeing what it is to be co-teaching with a colleague at a professional level. I'm having mixed feelings about what I'm seeing...but it is a first-hand account of what it is to be co-teaching.

Despite the positive collaboration efforts, Anne demonstrated a negative attitude about professional collaboration when she pointed out: “For those of you who are special ed, I know you’ve already taken a class in (subject). I guess that’s one of the cons of co-teaching.” Maria responded by saying that “it is always helpful to hear it twice...you’ll have a better understanding”. However, students asked questions like “Why can’t I go to either professor’s office hours?” A GE focus group participant expressed their frustration with the subject:

I think the problem is...some of their information is not well integrated.... They don't want to answer questions directly because they don't want to step on each other's toes...it's unpolished at times.... They need to be aware of each other's expectations.... The team teaching aspect needs to be developed more.

Although the term had a rocky start, gains were made over time. When one professor was lecturing, the other comfortably made comments and suggestions without asking permission or speaking over the other. In a change from the first class, Anne and Maria announced in Week 7 that assignments would be graded together. Perhaps as a result of this shift, during Week 10, students started talking about collaboration as a by-product of the subject.

Alternatively, the Study 2 professors had goals other than the prescribed curriculum, which Ella described in an email interview after the end of the quarter:

General and special ed teachers should have an opportunity to take a class together at a later point (when they have more professional knowledge) and in the context of a smaller class (that would promote discussions). I am convinced that they need to have this experience to dispel the mystery of each other's expertise...[and] have opportunities to interact in a non-confrontational way before the real-life experiences of IEPs, negotiations of students' placements and accommodations.

Ella’s philosophy and positive attitude toward the collaborative model was reflected in Study 2’s observations, document review and participant responses in focus groups and surveys.

Before the beginning of the quarter, Susan and Ella emailed back and forth discussing the finer points of the first joint sessions. Before they met on the first night, they established contact with all students, and students had access to information and to both professors through a meta-subject.

Their collaboration and appreciation for each other was evident in emails from professors to students thanking them for attending joint sessions and reminding them of assignments or a room change; these were usually signed by both professors.

Both professors, seeing the opportunity to teach through their own positive attitudes and beliefs about collaboration and inclusion, commented in class and online throughout the quarter about the benefits of collaboration and the need to learn skills for teaching all students effectively. When answering student questions, Susan and Ella often responded with commentary on the importance of collaboration and learning from each other. As students worked in groups during the fourth joint session, Susan said, “I hope you remember this collaboration when you are working to help kids reach their potential.” During the third joint session, Ella said to the GE students:

For those of you who came for the first time to the learning centre [on campus program where SPE candidates teach community children] on Saturday, feel free to contact your special-education co-teachers and take part in planning, brainstorming and taking charge of parts of the lessons. I know my student teachers would welcome your ideas.

The creation of the meta-subject created multiple opportunities for collaboration between the two classes and among classmates, despite not meeting together on a weekly basis. Professors took every opportunity to show their appreciation for each other, their students and the benefits of working collaboratively; they consistently referred to groups of students as “colleagues”, furthering the concept of professional collaboration. By the fourth joint session, students were referring to one another as “colleagues”. It is noteworthy that in the last week of the quarter, during a non-joint class, Susan integrated topics learned in the joint sessions. For their final projects (non-joint), GE students had to create accommodations and modifications for hypothetical students with disabilities, emphasising the importance of learning about disability and collaboration. When asked about using a calculator in math class, one GE participant said, “I don’t like it but understand that some people need to use one to demonstrate knowledge.” When presenting accommodations for their hypothetical student, a GE participant exclaimed, “I didn’t realise how important proximity (to the teacher) is...it’s really important!” Throughout the presentations, students referred to handouts and lecture material from the joint sessions, noting the importance of the information given in those sessions.

The greatest testament to a shift in attitude due to this subject was shown in the open-ended survey responses. One GE participant wrote, “As a result of this class, I do not feel uncomfortable with the idea of having students with special needs in my class anymore.”

Summary of themes

The themes indicate that the benefits of collaboration were apparent. In Study 1, students appreciated the collaboration being modelled by their professors, while in Study 2, students became hyperaware of the possibilities inherent in collaboration based on their professors’ use of Moodle, shared planning and collaborative assignments. In both studies, students felt grateful for the enrichment they received from having two perspectives from different experts.

The attitudes brought to collaboration trickled down at all levels. In Study 1, professors’ lack of planning to unify the subjects and their apparent discomfort with one another and the model translated into awkward student group-work dynamics and inconsistent attendance, which, to some

degree, were modelled by the professors. Similarly, students in Study 2 responded to their professors' behaviour. They were encouraged by their professors' positive attitudes to the extent that the students volunteered their time to attend joint sessions and visit the learning centre to experience fully the benefits of collaboration.

In both instances professors' attitudes carried over to students; this, in turn, affected overall group dynamics and student motivation (as shown by attendance and participation in voluntary activities).

Discussion

We know from the literature that attitudinal barriers can prevent effective collaboration from occurring in schools, which in turn affects the learning opportunities for students. In the limited research on collaboration among professors, especially regarding pre-service programs across the special- to general-education spectrum, professors' concerns mirror those of in-service teachers. The result is that SPE pre-service teachers who take as few as one required subject on collaboration, and GE pre-service teachers who receive minimal training in the area of disability and often no training regarding collaboration, enter the workforce and continue the cycle of ineffective collaboration practices, thus furthering negative attitudes about disability and inclusion. This study presented two cases of collaboratively taught pre-service subjects; the accompanying analysis can inform efforts to help improve upon existing pre-service education and promote positive attitudes towards professional collaboration and inclusion. Studies 1 and 2 have shown that teacher-preparation programs do in fact have the ability to help shape attitudes about collaboration through direct teaching and modelling.

Direct teaching and modelling: Purposefully teaching collaboration and positive attitudes

When discussing the two studies and their differences, it is important to consider the possible impact of professor personality. Some personalities and combinations of personalities lend themselves to working in groups; others might lend themselves better to working alone. Susan and Ella had worked together previously, indicating that they had established a working relationship worthy of continuing as they pursued collaborative teaching a second time. Anne and Maria, however, were teaching together for the first time in Study 1. As they did, they learned about one another, their teaching styles and possibly themselves and their ability and willingness to work collaboratively with other faculty.

Taking experience and relationship history into consideration, the researcher's main interests are in the process of professor collaboration, including the planning and execution of a collaborative subject, and student outcomes in terms of a hypothesised shift in opinion or attitude towards collaboration and the inclusion of children with disabilities in GE subjects. Through this lens and considering the variables outside the researcher's control, these two very different cases and their outcomes can be examined.

Study 1

Despite the fact that the Study 1 subjects were actually separate classes housed in two departments, that they met on the same night and time could have allowed the professors an opportunity to create a truly collaboratively taught subject by planning ahead and instituting measures that unified the two subjects, such as a single syllabus. Multiple data sources showed student confusion and, at times, frustration about the collaborative model due to different syllabi, little to no communication about the subject model ahead of time, late meta-subject establishment,

differing perceived professor expectations and different methods of presenting the material. In reality, the Study 1 professors merged similarly themed subjects while demonstrating the “one teach, one assist” model of collaboration. Collaboration was not explicitly discussed; it was simply the method by which Maria and Anne taught: students learned about collaboration by watching and taking part in this class. This study’s findings suggest that students appreciated the opportunity to learn from being part of a collaboratively taught class.

Focus-group and post-subject survey responses indicate that most respondents were willing to take another collaborative class due to the benefit from hearing multiple perspectives on one topic and, to a lesser degree, to the ability to observe collaboration modelled. From this perspective, students witnessed Anne and Maria improve their collaboration skills over the subject; the two professors were, as a result, successful in promoting the concept of collaborative teaching. In a traditional subject, the goal is mastery of academic content. Assuming that goal was met in Study 1, the additional benefit of “teaching” collaboration by modelling the behaviour added to Anne and Maria’s effectiveness. It is important to acknowledge that over the 10-week subject, Anne and Maria’s comfort and proficiency with collaboration appeared to improve.

Study 2

As in Study 1, the Study 2 professors had departmental approval to collaborate; however, due to the cancellation of the GE class that was originally to have met on the same night as the SPE class, the classes were scheduled on different nights, posing hardships for all participants. Despite these difficulties, the creation of joint sessions allowed participants the opportunity to attend portions of the class that were co-taught, and brought the same students back week after week for this voluntary experience.

The professor email interview responses showed that from the beginning, the professors intended to not only teach the prescribed content of the class, but also to show collaboration in practice and transfer the benefits of a mixed student population to professional practice. Observations and document review showed the detailed planning used to create a collaborative and inclusive environment that could permit these additional goals to be accomplished. Ongoing communication between the professors indicated their support and interest in each other’s joint session presentations, which spilled into the presentations themselves, which heavily emphasised the importance of collaboration among professionals and the benefits and methods of working with students of varying ability in an inclusive setting. Communication in class and online were collaborative and frequent, beginning with the meta-subject, which was used before the quarter officially began to make introductions, explain the subject model and make materials available. The professors almost exclusively used the pronouns “we” and “ours” instead of “I” and “mine” when referring to the presentations or students. Students were referred to as “colleagues” and thanked weekly for participation and helping each other. Participants reflected this effort in survey and focus-group responses, which showed that the students viewed both professors as experts; similarly, participants grew to respect their classmates as professionals with different but equally important roles in the education of all students. It is possible that the students’ apparent dedication to collaboration and teaching disability was due, at least in part, to the fact that Susan and Ella had previously taught a collaborative subject and that both professors had experience teaching students with varied abilities. Focus-group and survey responses indicated that overall, the greatest concern about this subject was that the joint sessions were too few due to scheduling difficulties, and that the university should make attending such a class a requirement for all future educators.

Overall outcomes

Studies 1 and 2 were quite different in presentation and student response; however, valuable gains were made regardless of the model. While attitudinal outcomes were more promising in Study 2, participants from both classes understood the value in being part of this program. In short, there is an attitudinal benefit in taking a collaborative class, as almost all students came to recognise collaboration as a workplace reality and to value the modelling and opportunities that arose from being a participant. A comparison of the two studies shows that modelling collaboration can have a powerful impact on negative attitudes toward disability, collaboration and inclusion. Importantly, as demonstrated by Study 2, collaboration need not occur weekly to show a positive outcome. To maximise the impact of the collaboration model, students should be explicitly reminded that collaboration is a workplace reality; otherwise the lessons and opportunities presented might be ignored. This direct and indirect teaching methodology can shape students' attitudes about disability and collaboration as they learn content specific to their program.

Students, regardless of whether they like the professors, the class or the material, see the value in this method of pre-service education. These studies should help encourage the practice of collaboration across education disciplines in an effort to teach pre-service educators collaborative methods and the value of collaboration.

Limitations

Due to the nature of the cases, there are methodological limitations inherent to the method of their selection and study. The small number of cases analysed makes the generalisation of findings unfeasible, although the goal of this study was to contribute to a small body of literature. The selection of the cases was done by happenstance rather than through the use of specific selection criteria. Heterogeneity of participants in each subject (i.e., a blend of graduate and undergraduate students in each) prohibits discussion of the impact of previous experiences or focal area of study as it relates to participant responses. Additionally, it would have been ideal to study the professors teaching the same collaborative class during two different quarters; but due to the grant applicant pool and subject-availability constraints, documenting two cases was limited to distinct subjects and professors.

Because the literature base specifically addressing collaborative-teaching case studies at the post-secondary level is relatively narrow, this case study provides valuable contributions to expanding the literature despite its limitations.

Implications for research

Considering the small number of cases in this study, further examination of the process and effect of professor collaboration in pre-service programs is necessary to document the effects of the use of collaboration models in pre-service, cross-curricular classrooms. Consistency in data-collection method and analysis would be helpful to more accurately compare the effects of the model on students' attitudes and beliefs about inclusion and disability as a result of participation in collaborative classes. Longitudinal research of professor dyads might shed light on the process and development of professional relationships and effective methods of teaching collaboratively as they develop over time, informing policy and procedure for future collaborative education subjects. Following student participants as they complete coursework, and ultimately into the workplace, would document long-term effects of their experience, which may have widespread implications for policy and practice at the pre-service level.

Implications for practice

Observation of two collaboratively taught pre-service subjects has implications for determining potential benefit and best practices for collaboration implementation. This study's findings suggest that there is great potential to help guide pre-service institutions in the creation of collaborative programs.

Given the opportunity, education professors can teach collaboration by simply modelling it in their own practice. Professors should recognise that when they model various methods of collaboration in class, students will learn by observing and likely accept, or at least not reject, collaborative models as practice in their own classrooms. Training for all professors across the department should include practices such as merging syllabi, explaining the class model in the subject description, and creating a meta-subject. These measures might have a great initial impact on students' perception of collaboration and the benefit of enrolling in collaborative subjects. Implementation of these measures would provide for a smooth first night of class, and the collaborative model would be an expectation rather than a surprise. As seen in Study 2, professors' knowledge, planning and enthusiasm about including children with disabilities through collaborative models was possibly the greatest contributing factor to positive student outcomes.

The findings from these cases suggest the potential for academic, attitudinal and professional benefits. Increased training opportunities for professors of pre-service teachers can help bridge the information gaps about the benefits of collaboration and the importance of disability knowledge and inclusion.

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