

Science and Mathematics Education Centre

School of Education

Co-Teaching in Health Sciences in Higher Education

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Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Human Ethics (For projects involving human participants/tissue, etc.): The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007) – updated March 2014. The proposed research study received human research ethics approval from the Curtin University Human Research Ethics Committee (EC00262), Approval Number #SMEC-13-14.

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Abstract

The main purpose of this research study was to explore students' and teachers' perceptions and experiences of co-teaching in a first year undergraduate human biology unit in a higher education institution. Co-teaching is a collaborative teaching strategy in which two teachers take mutual responsibility for planning, teaching, assessing and providing feedback to their students in a common teaching space. Though a common teaching practice in pre-service teacher training and primary and secondary schools with special needs students, co-teaching is rapidly emerging as a pedagogical approach in higher education institutions with potential to prepare students in professional programs in a collaborative learning environment. This human biology unit (HUMB100) explores students' understanding of correlations between structures and functions of various body systems in an interprofessional, collaborative learning environment using co-teaching pedagogical approach. Research in co-teaching over past decades in different contexts has emphasised the benefits and challenges encountered by students and co-teachers. Being a newly practiced pedagogical approach in higher education, co-teaching needs to be assessed for its appropriate conceptual understanding, execution and effectiveness. Students' and teachers' views of co-teaching were sought, following van den Akker's (2003) conceptual framework, to achieve a better understanding of intended, implemented and attained versions of co-teaching based on their own perceptions and experiences.

This study uses a case study research design with a mixed-methods approach. Qualitative and quantitative data were collected to identify multiple perspectives that would enhance and develop a more complete understanding of the co-teaching practice in higher education. A survey instrument *Co-teaching Perception and Experience Survey (CPES)* was developed and validated in a preliminary study with students. The refined CPES instrument consisted of three sections, comprising of demographic questions, 29 items in five scales with a 5-point Likert response and three open ended questions for co-teaching perceptions. In the preliminary trial, the survey instrument was tested with students (n=528) and then the refined version tested for its validity and reliability with students (n=1,111) and co-teachers (n=26). The exploratory analysis of the refined survey instrument revealed a high Cronbach alpha reliability with the students (0.85 to 0.90) and co-teachers (0.77 to 0.90) consistent with preliminary analysis with students (0.85 to 0.93).

Qualitative and quantitative student responses collected through the CPES instrument and eVALUate predominantly revealed co-teaching as an effective teaching strategy bringing diversity in knowledge and experience to classrooms. They also experienced better student support, interaction and engagement due to lower student-teacher ratios. Students also appreciated learning about professional and transversal competencies like collaboration, communication and cooperation. However, they also reported some challenges that the students attributed to lack of professional behaviour and conflicts between some co-teachers.

The qualitative and quantitative data collected from co-teachers through CPES instrument and interviews revealed their perceptions and experiences of co-teaching. It was apparent that most co-teachers shared their teaching mutually to varying degrees, however, a few perceived co-teaching as ‘you teach, I teach’ approach. The co-teachers predominantly reflected a positive attitude towards co-teaching that they attributed to peer-learning, interpersonal interaction, better learning and teaching environment and continuous professional development. However, there were challenges reported that were mainly due to conflicts and lack of interpersonal skills, professional behaviour and parity.

What stood out from the recommendations of students and co-teachers, however, was that both strongly recommended for purposeful pairing of co-teaching pairs and professional development workshops to enhance co-teachers’ conceptual understanding of co-teaching and training in effective interpersonal communication.

This is the first study to expansively investigate students’ and co-teachers’ perceptions and experiences of co-teaching in a higher education environment and as such has made positive contribution to the conceptual understanding of how co-teaching is perceived in this environment. The instrument developed (CPES) provides a new survey instrument that would allow evaluation and analysis of co-teaching settings in other higher education institutes. The outcomes identified in this research study will help administrators and policy makers make informed decisions before implementing co-teaching and so provide students and co-teachers better learning and teaching experiences.

Conference Presentations

Crowley, J., Dhar, A., Duncan, S., & Wong, R. (2017, April 2-April 3). *Can co-teaching be used to improve intellectual involvement and the scholarly profile of sessional academics?* Paper presented at the 27th Teaching and Learning Forum, Curtin University, Perth. Retrieved from <http://clt.curtin.edu.au/events/conferences/tlf/tlf2017/abstracts.html#crowley>

Crowley, J., Dhar, A. & Fyfe, G. (2016, January 28-January 29). *Is co-teaching just load-sharing or can it provide opportunity for peer review?* Paper presented at the 26th Teaching and Learning Forum, Perth, Australia. Retrieved from https://www.wand.edu.au/Media/Default/Docs/17-63%20Abstracts%202016_3.pdf

Dhar, A., Fyfe, G. & Treagust, D. (2016, November 27 – December 1). *Transforming co-teaching in higher education: academics' perspectives.* . Paper presented at the Australian Association for Research in Education (AARE) Conference, Melbourne, Australia. Retrieved from <https://www.aare.edu.au/publications/aare-conference-papers/show/10718/transforming-co-teaching-in-higher-education-academics-perspectives>

Dhar, A., Fyfe, G., Treagust, D. & Koul, R. (2015, January 29 – January 30). *Transformation through co-teaching: Perceptions of first year health science students.* Paper presented at the 25th Teaching and Learning Forum, Perth, Australia. Retrieved from <https://www.wand.edu.au/teaching-and-learning-forum-2015-abstracts>

Dhar, A., Fyfe, G., Treagust, D. & Koul, R. (2015, July 1- July 3). *Student perceptions of co-teaching in higher education: A pilot study.* Paper presented at the 46th Annual ASERA Conference, Perth, Australia. Retrieved from <https://www.asera.org.au/sites/default/files/2017-04/ASERA-2015-program-and-abstracts.pdf>

Dhar, A., Treagust, D. & Fyfe, G. (2016, April 14-April 17). *Instructors' perspectives on inter-disciplinary health sciences co-teaching in higher education.* Paper presented at the 89th Annual International Conference, NARST, Baltimore, USA. Retrieved from https://www.narst.org/annualconference/NARST_2016_Abstracts.pdf

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I dedicate this thesis to my mother Usha Rani Kaul, a home maker, who always valued education and dedicated her life inspiring us to excel in educating ourselves. It was her dream to see the title of ‘Doctor’ with my name, hence one of my aims to undertake a Ph.D. journey. My accomplishment would not have been possible, of course, without the educational foundation and support of my father, Pushkar Nath Kaul. I owe my success to my parents’ dedication, motivation and inspiration to instil great values and respect for education in me.

“I am still learning” - Michelangelo at age 87

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Abbreviations

CPES	Co-teaching Perception and Experience Survey
HSF	Human Structure and Function
HUMB	Human Biology
CT	Co-teaching

Glossary of Terms

Unit	A unit is a discrete entity to study within a subject area and is the fundamental component for teaching, learning and assessment. (Curtin website, http://handbook.curtin.edu.au/)
Course	A course is a structured combination of approved units which when completed qualifies the student for an award from Curtin. A course may include a major(s), minor(s) and/or, stream(s). (Curtin website, http://handbook.curtin.edu.au/)
eVALUate	Curtin's online system for gathering and reporting student feedback on their learning experiences (Curtin University website)
Anatamage Table	A virtual dissecting tool created with computed tomography (CT) scans of human body that facilitates learning of human anatomy.

Chapter 1.

Introduction

1.1 Overview

This study provides an in-depth exploration of students' and teachers' perspectives of a co-teaching pedagogical strategy currently implemented in a first-year undergraduate anatomy and physiology unit called 'Human Structure and Function (HUMB1000)' in the Faculty of Health Sciences at Curtin University in Western Australia. The incentive to investigate general perceptions and experiences of co-teaching was stimulated by my personal experience when initiated into co-teaching in HUMB1000 with different co-teachers.

Co-teaching in itself was a new experience to me, but in addition, every experience with each individual co-teacher was different, leading the way to this research journey. I wanted to explore how different co-teachers and students perceived co-teaching and to understand their insights and experiences of this co-teaching strategy. I also wanted to determine any key issues encountered by co-teachers while co-teaching that could be addressed to enhance the effectiveness of this pedagogical approach. I was inquisitive to discover if factors like gender, age, nationality, educational qualification or teaching experience had any impact on perception of co-teaching among students and co-teachers.

This chapter focusses on an overview of the background of research for this study (Section 1.2), provides insight into the rationale for the study (Section 1.3), and an understanding of the research context (Section 1.4), identifies various objectives of the study (Section 1.5), the key research questions that guided the enquiry (Section 1.6), and an outline of the research methodology employed (Section 1.7). The chapter also explains the conceptual framework guiding this research (Section 1.8), describes the significance of this study (Section 1.9), concluding with the organisation of the thesis (Section 1.10).

1.2 Background

Most Australian universities have presented themselves as key international education providers by improving teaching excellence and research through promoting initial professional development to establish quality teaching in higher education (Land & Gordon, 2015; Worthington & Higgs, 2010). Australian universities are self-accrediting institutions and have autonomy over course content, delivery mode, assessment, grading and the graduation of students. However, due to recent changes in economic conditions, there is pressure on institutions to be more efficient with resources in terms of time, money, productivity and accountability (Hazelkorn, 2013). Budget cutbacks and general resource constraints have become routine, while institutions are being asked to serve increasing numbers of students (Shah, Lewis, & Fitzgerald, 2011). These background events resonated with the concerns raised by Downie (2013) at Curtin University to transform teaching and learning in response to the changing scenario of Australian higher education. Democratisation and globalisation of knowledge, demands from industry for integration of knowledge with workplace experience, use of enhanced technology and contestability of funding and large student enrolment numbers pose financial and pedagogical challenges. At the same time, students demand more flexibility in learning experiences and content delivery.

The traditional mode of instruction in higher education is typically siloed and didactic, delivered by an individual instructor in compartmentalised lecture theatres. However, there is a greater shift towards student-centric teaching and learning strategies brought about, in part, by these changes in the educational landscape such as massification, multiculturalism and globalisation of education complemented by flexible and blended learning (Van der Wende, 2003). Such educational goals are consistent with those of the health care workforce who also are expected to perform as interdisciplinary and interprofessional teams (Duckett, 2005). Consequently, in the Health Sciences there is a demand for inculcating such collaborative practices in higher education institutions (Baker & Durham, 2013; Hean, Craddock & Hammick, 2012). The expectation of interprofessional and inter-disciplinary attitudes in the health workforce supports the positive step towards accommodating collaborative teaching and learning methodologies in higher education classrooms (Matthews, Pockett, Nisbet, Thistlewaite, Dunston, Lee & White, 2011). The result is that the tertiary level pedagogical approaches are changing from a lecture focussed 'sage on the stage' strategy to a more hands-on 'guide on the side' approach (King, 1993). Professional educators are evolving new pedagogies to facilitate

better learning outcomes for increasingly diverse students. According to Friend (2008), co-teaching has emerged as an innovative and potentially effective approach.

Co-teaching usually involves two teachers working together in a teaching and learning context (Blonstein, Gleason, Milne, & Scantlebury, 2011). Each teacher of the co-teaching pair contributes to the collective responsibility for the plans, goals, enactment, and outcomes of the learning opportunity (Roth & Tobin, 2002). Co-teaching has not only developed as an effective instructional technique to make the most of the knowledge and expertise of two or more teachers, but also is a way of learning to teach, conducting research, supervising new teachers, and evaluating teaching in classrooms (Gallo-Fox, 2009; Roth, Masciotra & Boyd, 1999; Roth & Tobin, 2007).

Most of the studies reported in the literature regarding co-teaching have been conducted in inclusion classrooms of primary or senior secondary schools (see Chapter 2, Section 2.4.1) and in pre-service education (Dieker & Murawski, 2003; Milne, Scantlebury, Blonstein & Gleason 2011; Roth & Tobin, 2007). The research literature on co-teaching practices in higher education is emerging over the past decade (Bacharach, Heck & Dahlberg, 2008; Carpenter, Crawford & Walden, 2007; Ferguson & Wilson, 2011; Gillespie & Israel, 2008), for example, Brown and Lint (1982) used co-teaching when conducting auditing unit, while Plotnicov (1985) used co-teaching for teaching anthropology. A study that explained the benefits to teach childbirth by co-teaching methods within higher education in the field of nursing was conducted by Dumas and Montigny (1999) in Quebec, Canada. Cox and Ray (1990) used co-teaching in an advanced legal writing course at the University of Wisconsin. More recently, Bacharach, Heck, and Dahlberg (2010) conducted a study implementing shared teaching in a Master of Business Administration course. La Haye and Naested (2014) also experimented with co-teaching, integrating fully a visual arts and mathematics education course in Canada.

Many co-taught units or courses in higher education are simply a division of duties or roles, with educators teaching a part of the class schedule or a certain number of weeks as course credit load is divided. However, this model is not in the true spirit of co-teaching.

1.3 Rationale for the Study

My personal experience while co-teaching a unit in Health Sciences made me conscious of the need to probe the understanding of co-teaching among teachers due to the variation

in comprehension and implementation of this teaching practice with peers. While teaching multiple sessions with different co-teachers, I also realised that different teachers participated and played their roles differently, while the content and activities were the same. In some sessions, co-teachers would distribute teaching time equally, while in other sessions they would assign and deliver specific activities. There was only one case reported where one of the two teachers would prepare and teach on one day and the other would not prepare and engage in teaching, and reverse their roles for same class the next week. Only in a few sessions did the co-teachers participate and teach together, thereby, truly sharing their roles. Moreover, teachers would give their feedback about content and timing during staff meetings, one held at the beginning, one during and one at the end of the semester. However, no effort was made to discuss the teaching strategy or the challenges encountered by different co-teachers or if any improvements were required to effectively implement this teaching strategy. The co-teaching practice was not assessed for its effectiveness among students, who are the main stakeholders. This aspect was the rationale for designing and conducting this study. These motives engendered and strengthened my resolve to explore the strategy, look deeper through the lenses of co-teachers and students about their perceptions and experiences of collaborative working as a member of a very large team of co-teachers.

1.4 Research Context

Curtin University introduced an interprofessional first year core unit ‘Human Structure and Function’ (formerly HSF 100; currently HUMB1000) in Health Sciences in Semester 1, 2011. It is a core unit taught over 12 teaching weeks in each semester and currently accommodates around 2,000 students enrolled in almost all Health Science degree programs including, among others, Medicine, Nursing, Pharmacy, Physiotherapy, and Occupational Therapy. Curtin University also introduced Flipped learning strategy in this unit. HUMB1000 has a blended learning environment where students prepare content by reading lecture notes, watching online lecture videos and completing online quizzes. The mode of content delivery is a weekly online lecture followed by a two hour face-to-face interactive workshop where two teachers from wide-ranging teaching backgrounds and expertise jointly conduct various learning activities and laboratory sessions related to the topic of each week in a single teaching space. The focus of these activities is to engage students collaboratively in hands-on activities, discussion and problem solving.

Curtin University has four teaching Faculties of Business and Law; Health Sciences; Humanities; Science and Engineering; and a Centre for Aboriginal Studies. Each faculty consists of different schools. Co-teaching is practiced at Curtin University at different levels in the Faculties of Health Sciences, Science and Engineering, and Business and Law. The Faculty of Health Sciences offers many health-related courses in seven different schools. Each course consists of many units, some of which are common, interprofessional core units. HUMB1000 is one of the core units that involve co-teaching. The three other interprofessional core units that involve co-teaching are Foundations of Professional Health Practice (CMHL1000), Evidence Informed Health Practice (CMHL1001) and Indigenous Cultures and Health Behaviours (INDH1006). These units were introduced in 2011 as a result of an initiative for interprofessional education. Co-teaching was introduced to meet the demands of large class size and to facilitate interprofessional collaboration, but its perception, experiences and conceptual understanding by co-teachers and students has not yet been evaluated.

1.5 Research Objectives

The objective of the proposed study was to evaluate students' and co-teachers' perceptions and experiences of co-teaching that was implemented as a pedagogical approach in a university level interprofessional first year unit (HUMB1000) specifically in the Faculty of Health Sciences at Curtin University. The focus of the study (and relevant research questions presented in Section 1.6) were to:

1. Develop and validate an instrument to investigate students' and co-teachers' perceptions of co-teaching in a higher education learning environment (RQ 1)
2. Investigate first year students' perceptions and learning experiences of co teaching and co-teachers (RQ 2)
3. Explore co-teachers' perceptions of the philosophical concept of co-teaching (RQ 3a)
4. Investigate any correlation between co-teaching perceptions and factors like gender, age, nationality, educational qualification and teaching experience (RQ 3b)
5. Understand if co-teaching with different co-teachers can influence pedagogical praxis of co-teachers (RQ 3c)

6. Identify key issues in implementing a successful partnership among co-teachers (RQ 4)
7. Explore co-teaching experiences of co-teachers with regard to a) benefits and b) challenges (RQ 5)
8. Reflect on the effect of this research and my own co-teaching experience on my view of teaching and learning (RQ 6)

In addition the research develops recommendations to administrators and policymakers for promoting quality teaching and learning opportunities among co-teachers that would enhance co-teachers' and students' experiences.

1.6 Research Questions

To achieve the outcomes mentioned in Section 1.5, the following research questions were drafted to drive the study.

1. Can a valid and reliable tool be developed to evaluate co-teaching perceptions of students and co-teachers in higher education?
2. What are the perceptions and learning experiences of first year students regarding co-teaching as a pedagogical strategy in HUMB1000?
3. What are the perceptions of co-teachers regarding co-teaching as a teaching strategy in HUMB1000?
9. What are co-teachers' conceptual understanding of co-teaching as a teaching strategy?
10. Is there any association between perceptions of co-teaching and demographic variables such as age, gender, nationality and educational qualification?
11. How has co-teaching experience impacted co-teachers' own teaching praxis?
4. What strategies could be implemented to ensure effective co-teaching and positive learning experiences for students and co-teachers?
5. What are the teaching experiences of co-teachers using co-teaching as a pedagogical approach with regard to (a) benefits and (b) challenges?
6. How has this research on co-teaching in Health Sciences experience influenced my view of teaching and learning?

1.7 Research Methodology

Expectations and experiences of any event or topic can be subjective; to record and analyse them to form a generalisation can be an even more challenging task. Students' perceptions of effective teachers and teaching are influenced by various factors such as meeting the expectations, availability for consultation, facilities, and class size (Rivera-Torres, Lado-Cousté & Cardone-Riportella, 2001). Understanding that every person is different, and perceives his or her experiences of a situation differently than others, potentially gives rise to multiple layers of perceptions (Tobin, Briscoe & Holman, 1990). Consequently, a multiple paradigmatic approach using both interpretive and post-positivist paradigms was employed to gain an overall view. A case-study research methodology using mixed method of data collection was deemed suitable to inform an in-depth understanding (Creswell & Plano Clark, 2010; Yin, 2009) of students' and co-teachers' perspectives of co-teaching. The data collected was both qualitative and quantitative in nature. The quantitative data comprised responses to the survey questionnaire (CPES) administered to students and teachers. The data were analysed using qualitative (NVivo Pro (v11)) and quantitative (SPSS v25) data analysis tools. The qualitative data included interviews with co-teachers; three open ended questions from the Co-teaching Perception and Experience Survey (CPES) and feedback from students' comments retrieved from eVALUate student surveys.

1.8 Conceptual Framework

The study explored current co-teaching perceptions and experiences of students and co-teachers in a higher education learning environment. The conceptual framework to guide the research is based on van den Akker's (2003) classification of curriculum development. Curriculum development is a long, ongoing cyclic process developing from a generic to a more explicit version, based on various aspects of educational change and specifics of educational context. Similarly, the introduction of a pedagogical strategy benefits through the rigour of feedback and improvement following the levels of development suggested by van den Akker (2003).

Three levels of curriculum development have been suggested by Van den Akker (2003) namely, intended curriculum, implemented curriculum and attained curriculum. The intended curriculum represents the vision or basic philosophy (ideal) guiding the development of the curriculum and the intentions of policy makers and developers as

specified in instructions (formal). The implemented curriculum represents the perceptions and interpretations of users/teachers (perceived) and its enactment in actual classrooms (operational). Finally, the attained curriculum represents the student outcomes in terms of how they learned through the experiences (experiential) resulting in learners' outcomes (learned). The different forms provide an understanding if changes are required to address gaps in ideals and outcomes. This curriculum development conceptual framework has been used in various contexts to compare intended, implemented and attained curricula (Friedel & Treagust, 2005; Hartley, Treagust & Ogunniyi, 2008).

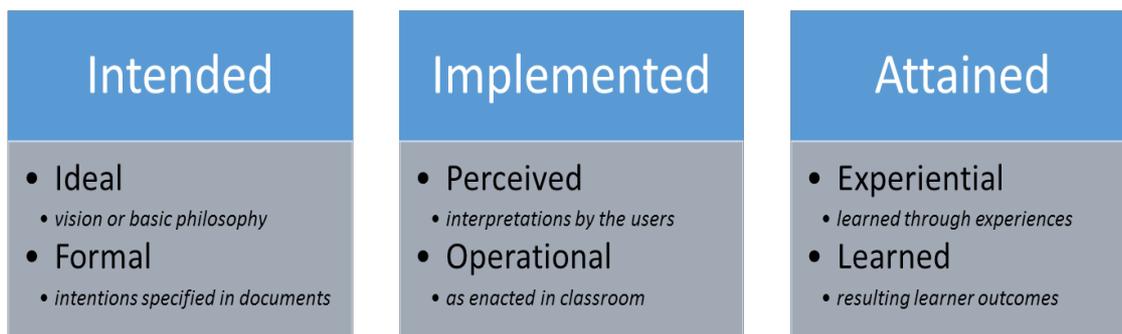


Figure 1.1 An illustration of the conceptual framework for the research study (adapted from Van den Akker, 2003).

The conceptual framework of van den Akker (2003) is used as a conceptual framework in this study to draw a parallel between curriculum development and pedagogical development. A search of the literature revealed the perceptions of a co-teaching pedagogical approach (ideal) and discussion with unit developers provided me with an insight for their selection of co-teaching (formal) as a teaching strategy. The main aim was to provide students with better learning experiences and introduce interprofessional learning. The perceptions and experiences of students and co-teachers collected through surveys, interviews and eVALUate comments provided an insight into the implemented (perceived and operational) aspects of this pedagogical approach. My own experiential encounters and challenging conflicts reported by other co-teachers revealed the gaps in co-teacher's perceptions of co-teaching.

Addressing these gaps can enhance the co-teaching experience for both students and co-teachers (attained) thus improving students' and teachers' learning and teaching experiences.

1.9 Significance of the Study

The overarching aim of the study was to evaluate co-teaching in a higher education setting. The study is significant because there are no reports of a comprehensive study investigating students' and co-teachers' perceptions and experiences of co-teaching in a higher education learning environment. Formerly, the opportunity to incorporate co-teaching strategies at the university level was very limited. However, with changes in higher education teaching and learning approaches, many more units are considering this strategy. Hence, it will be useful to understand the perceptions and experiences of both co-teachers and students to highlight the challenges they encounter. The study outcomes are intended to assist policy-makers and administrators to design strategies for high quality co-teaching enhancement. Based on such evidence, programs or resources for co-teaching could be designed so that they support reforms and strengthen the strategy leading to better student learning experiences.

The effectiveness of co-teaching at primary and secondary school level, especially in inclusive education, has been well documented (Scruggs, Mastropieri & McDuffie, 2007; Mastropieri, Scruggs, Graetz, Norland, Gardizi & McDuffie, 2005; Murawski & Swanson, 2001). However, few studies have been published about co-teaching at a higher education level. Results from this study may give researchers an opportunity to evaluate the practice and highlight any ambiguities in its perception. It may also dispel any misinformation by assisting policymakers and potential co-teachers to identify challenges before embarking on a co-teaching partnership. These challenges could be mitigated through professional development workshops which can further assist co-teachers in delivering content effectively while fostering positive attitudes to teaching and learning and improving student learning experiences.

This research project developed a new survey instrument titled *Co-Teaching Perception and Experience Survey* (CPES) to assess the perceptions and experiences of students and co-teachers in a higher education environment. The data from this instrument can be used to assess other emerging learning environments that use co-teaching. The outcomes of this study may also be used to influence administrators, policymakers and other stakeholders in higher education institutions to make informed decisions and to enhance the effectiveness of this strategy. It can also be considered for implementation in other faculties of this university or other universities.

1.10 Overview of the Thesis

The thesis consists of nine chapters presenting a detailed description of this research study. The overall structure of the chapters in the thesis is formatted as per the following outline.

The first chapter summarises the background and rationale for starting this research study, followed by the research context outlining the objectives and research questions to be investigated. A brief overview of the methodology and conceptual framework guiding the research process and interpretation of the significance of this study are also reported in this chapter.

The second chapter reviews the literature relevant to this study focussing on the concept of co-teaching, its implementation in various educational settings, various models of co-teaching and studies conducted at the higher education institutions to demonstrate various perceptions and experiences of students and co-teachers regarding co-teaching. A brief review of the reported benefits and challenges is also discussed to provide a substantiated view of co-teaching.

In the third chapter, the research methodology is described emphasising the research design of the study and providing justification for using mixed-methods approach. The chapter also presents an update on the nature and size of the study sample along with data collection procedures of surveys and interviews. Data analysis techniques employed to analyse quantitative and qualitative data at all stages of investigation are presented to conclude the chapter.

Details of the processes and procedures followed in developing the CPES instrument to assess co-teaching in higher education in a preliminary study are presented in the fourth chapter. This chapter discusses the specifics of refining and validating the survey instrument to be used later in the study. The chapter concludes with an exploratory analysis to establish validity and reliability of the CPES survey instrument with a smaller co-teacher and a larger student sample.

A detailed description of the data analysis and results of quantitative and qualitative data evaluating students' perceptions and experiences of co-teaching are presented and explained in the fifth chapter. The data analysis and the interpretation of the results are used to answer research question 2.

A detailed description of data analysis and result of quantitative and qualitative data from the CPES instrument evaluating teachers' perceptions of co-teaching are explained in the sixth chapter. This chapter also discusses any correlation between selected demographic variables and co-teaching.

Chapter 6 also reports on the impact of co-teaching on teaching praxis of interviewed co-teachers. The data analysis and the interpretation of the results are used to answer research question 3 (a, b and c).

The seventh chapter presents a detailed data analysis and interpretation of teachers' experiences of co-teaching regarding benefits and challenges of co-teaching. Suggestions for enhancing effectiveness of co-teaching by students and co-teachers are also discussed in this chapter. This chapter provides answers to research questions 4 and 5.

The eighth chapter presents details of my reflective journey as a co-teacher, exploring the impact of co-teaching and fellow co-teachers on my growth and development as a teacher. The chapter also discusses the socio-cultural impact on the development of my identity as a co-teacher and addresses research question 6.

Finally, the ninth chapter discusses the major findings of the study, reflecting on the outcome of students' and co-teachers' perceptions and experiences of co-teaching. This last chapter also recommends strategies to strengthen co-teaching practices and identifies directions for future research. Significant developments during the course of this research journey are discussed that highlight the impact on current co-teaching practices at Curtin University.

The outline is summarised in Table 1.1 overleaf.

Table 1.1

An overview of the thesis organisation

Chapter	Topic	Summary	Research questions
1	Introduction	An overview of the research process	
2	Review of the research literature	Discussion of research literature pertinent to the study	
3	Research methodology	Elaboration of research design and its relevance	
4	Development and validation of Co-teaching Perception and Experience Survey (CPES)	Explanation of the process of development and validation of survey instrument to evaluate co-teaching perceptions	RQ 1
5	Students' perceptions and experiences of co-teaching	Data analysis and result of students' perceptions and experiences of co-teaching	RQ 2
6	Co-teacher's perceptions of co-teaching	Data analysis and result of co-teachers' conceptual understanding of co-teaching, its impact on their teaching praxis and any correlation between co-teaching and selected demographic variables	RQ 3 (a,b,c)
7	Co-teacher's experiences of co-teaching	Data analysis and result of co-teachers' experiences of co-teaching regarding benefits and challenges of co-teaching and effective co-teaching strategies	RQ 4 & 5
8	Being a co-teacher – a reflective journey	My own reflective journey emphasising the impact of social interactions on teacher identity and praxis	RQ 6
9	Summary, conclusions, and recommendations	The final outcomes of the research study	

1.11 Summary

This chapter has provided a brief overview of the process of carrying out the proposed research study by outlining the background, rationale, objectives and methodology. The significance and limitations of this research have also been acknowledged and reported. Finally, a brief overview of contents of each thesis chapter has been presented.

Chapter 2.

Review of the Research Literature on Co-Teaching

Alone we can do so little; together we can do so much – Helen Keller

2.1 Introduction

The extant literature available on various aspects of co-teaching was reviewed to provide a holistic view of the definitions and theory of co-teaching pedagogy, from its origin and evolution to its current divergence in various educational and non- educational fields. The review also focussed on strengths and challenges encountered in the implementation of co-teaching in various educational settings. Although co- teaching was introduced previously in the 1960's (Villa, Thousand & Nevin, 2004) to reform educational opportunities for children, its importance emerged after the introduction of various legislative instruments such as *Education for All Handicapped Children's Act* (EHA, 1975), *Individuals with Disability Education Act* (IDEA, 1997), and *No Child Left Behind Act* (NCLB, 2001) in the United States of America.

The co-teaching strategy that was initiated in special education for inclusive education in the United States has subsequently been successfully introduced in various forms in academic studies such as pre-service teacher education, primary and secondary school teaching, professional development in various fields and more recently in higher education. This literature review explores perceptions and experiences of co-teachers and students in all the fields mentioned previously, providing a greater insight and thus adding to the understanding of the complexities of this apparently simple service delivery option.

This chapter reviews the pertinent literature apposite to the current study to provide a rich background supporting the purpose and relevance of the research questions that need to be addressed. Sections 2.2 and 2.3 review the concept of co-teaching and various alternate forms of co-teaching as reported in the literature. Section 2.4 explores the diversity of applicability of this pedagogical practice. Sections 2.5 and 2.6 discuss the general

perceptions, strengths and challenges of co-teaching followed by summary of chapter in Section 2.7.

2.2 The Concept of Co-Teaching

Co-teaching is a compound word formed by merging two words, collaborative and teaching. ‘Collaborative’ as explained by the Oxford Dictionary (2016) means “produced by or involving two or more parties working together”. In a collaborative process, individuals take responsibility for their own learning and show respect and share with others involved. Co-teaching practice was initially introduced in the United States in the field of general education and is a continuation of team teaching arrangements in the 1960’s as observed by Bair and Woodward (1964) and cited by Reinhiller (1996). It has evolved over the years and has found to be effective in fields like pre-service teacher training, special/inclusive education, primary and secondary school education, professional development and other fields of higher education (Dieker & Murawski, 2003; Friend, 2008; Gallo-Fox & Scantlebury, 2016; Roth & Tobin, 2007). The researchers in each of these fields have contextualised the definition, interpretation and practice of co-teaching to suit their own perspectives, leading to some idiosyncrasies in characterizations (Friend & Cook, 2010). However, there are commonalities that can be drawn from diverse co-teaching contexts (Murphy & Scantlebury, 2010).

It is important to have a strong conceptual understanding of co-teaching and its components because various terms are used in the literature that is synonymous with co-teaching but have differing nuances of meaning. Collaborative teaching, cooperative teaching, team teaching, tag team teaching, coteaching, teaming, and grazing are some of these terms that are commonly used interchangeably with co-teaching (Reinhiller, 1996). Martin (2009) has emphasized on the methodological and epistemological differences between team teaching, cooperative teaching, coteaching and co-teaching. It is easy to become entangled in the web of these words and lose the authentic essence of co-teaching. Co-teaching is often confused with team teaching and tag teaching, both of which are being frequently observed in higher education. Team teaching and tag (team) teaching involves collaboration but the focus is more on taking turns to teach to one’s specialty and thereby decreasing workload (Roth & Tobin, 2005). Co-teaching on the other hand involves collaboration to share “collective responsibility” (Ferguson & Wilson, 2011, p. 54) of all aspects of classroom teaching for tangible student learning goals. Cook and Friend (2004) elucidated how co-teaching is different to team teaching and collaborative

teaching, stating that co-teaching creates an improved teacher-student ratio and amalgamation of two different teaching orientations.

In reviewing work of previous researchers, Reinhiller (1996) discussed fine-grained differences between collaborative teaching, cooperative teaching and co-teaching. He also referred to co-teaching as “both an art and talent” (p. 46) suggesting that with further research, co-teaching would grow into a “research based collaborative activity” (p. 47) which is the case with the current research study. Martin (2009) has emphasized on the methodological and epistemological differences between team teaching, cooperative teaching, coteaching and co-teaching. Coteaching is a pedagogical practice that developed from a specific logical approach to knowledge generation, whereas, co-teaching developed from the field of special education wherein two teachers share the responsibility for teaching a single group of students. As a researcher experiencing teaching in HUMB1000, I realised that the pedagogical approach implemented had characteristics of co-teaching. Hence, for the rest of the thesis, co-teaching term shall be used to address this pedagogical strategy.

The educational literature has many descriptions of co-teaching conceptualised by researchers in different contexts. The emerging theme from the literature regarding co-teaching is that there are two teachers who share the process of teaching including planning, instructing, assessing and giving feedback to a diverse student group in a single learning space (Bacharach, Heck & Dank, 2003; Cook & Friend, 1995; Murawski, 2003; Murphy & Scantlebury, 2010; Roth & Tobin, 2002; Villa, Thousand & Nevin, 2013). The co-teaching interaction involves active participation by both teachers enhancing the integration of their knowledge and capabilities for better student learning outcomes (Cook & Friend, 1995). In a teacher education context, Bacharach, Heck, and Dahlberg (2008) defined co-teaching wherein the cooperating teacher and student teacher plan, deliver and assess the lessons collaboratively, alternating their roles as to lead or to assist, resulting in a smooth transition from a novice to an experienced student teacher. In the same context Scantlebury, Gallo-Fox and Wassell (2008) defined co-teaching as “a strategy that can promote learning communities based on collective teaching, respect, and responsibility within classrooms and departments” (p. 968).

Regardless of the context of co-teaching, two or more individuals interact collaboratively to share their knowledge and expertise and achieve what they would not have been able to do single-handedly (Wenzalff, Beral, Wiseman, Monroe- Baillargeon, Bacharach & Bradfield-Kreider, 2002). Roth and Tobin (2002) described co-teaching as a collaborative

instructional technique and compared it to “teaching at each other’s elbow” to emphasise the close interaction.

The general perception of co-teaching encompasses two teachers, who might be trained in different specialist fields, taking joint responsibility for teaching a particular cohort of students in a single space to reach a common learning goal. Co-teaching does not occur simply when one person teaches a particular subject, and the other teacher either teaches a different subject or prepares and distributes instructional material or helps with behaviour management in the class or follows the instructions of the dominant teacher or acts as an assistant teacher (Cushman, 2004; Villa, Thousand & Nevin, 2013). Co-teaching happens when both teachers teaching in the classroom cooperate, collaborate and coordinate teaching and learning tasks to reach a common learning goal by alternatively engaging in sharing roles. It is common to see collaboration in research fields in higher education but not in teaching (Ferguson & Wilson, 2011) because in higher education teaching usually is conducted by one individual teaching in silo.

This scenario does not suggest that both teachers in a co-teaching team have to teach all the time. The key is to balance collaboration in such a way that both teachers carry out their responsibilities according to their strengths and improve on their weaknesses with a common goal of student learning. The two co-teachers can coordinate in such a way that when one is lecturing, explaining, or giving instructions, the other could be summarizing the key points, modelling note taking on the board, role playing, or scanning students who needed support. They could also be managing classroom behaviour or glancing over students’ work for errors or providing strategies for better understanding and retention (Kloo & Zigmond, 2008; Murawski & Dieker, 2004; Tobin, 2014), while concurrently focussing on what is being said to fill in any gaps.

The responsibilities would be different during alternate teaching, parallel teaching and station teaching. Such allocation of roles would also depend on the context of the learning environment. If one teacher is considering modification of learning activity, the other teacher could be providing enrichment exercises; if one provides silent reading support, the other could be facilitating reading aloud activity (Murawski & Dieker, 2004). It has been established (Dugan and Letterman, 2008; Jones and Harris, 2012) that a simultaneous co-teaching approach where both partners are actively engaged throughout the session improve both student and teacher experiences.

Cook and Friend (1995) explained co-teaching as a service delivery method wherein two certified educators share responsibility for planning, executing content and assessing a diverse group of students including behaviour management. Murawski (2009) compared co-teaching to a “professional marriage” (p. 21). Scruggs, Mastropieri and McDuffie (2007) proposed that both teachers should actively engage and reflect on progress and process by giving each other constructive feedback. Villa et al. (2013) described co-teaching as a “committed partnership” (p. 6) where the co-teachers share responsibility to teach, monitor progress of all students, cultivate trust and handle conflicts in an ingenious way.

Co-teaching does not happen naturally by placing two teachers in front of a group of students in a classroom (Clancy, Rosenau, Ferreira, Lock & Rainsbury, 2015). Both partners need to be involved and engaged with each other over a period of time (Yanamandram & Noble, 2005) with open and clear communication (Rytivaara & Kershner, 2012) not only during class but also as a reflective process. Bacharach, Heck, and Dahlberg (2008) emphasised how an effective co-taught session would look like by stating “an invisible flow of instruction with no prescribed division of authority... both teachers are actively involved in the lesson. “From a student’s perspective, there is no clearly defined leader – as both teachers share the instruction, are free to interject information, and available to assist students and answer questions” (p. 11).

Reflecting on co-teaching, Tobin (2014) suggested that “the central part to co-teaching is teaching together in ways that coordinate and compliment the teaching among co-teachers for the common good of all students” (p. 191). He critically explored fine nuances of co-teaching being used as a “new teacher training” (p. 192) strategy and reported its success since it provided increased opportunities for new and cooperating teachers to learn and grow. The only complications arose when the personalities of co-teachers did not match, for which they then offered a rearrangement. McCormick, Noonan, Ogata and Heck (2001) reported that the interaction and behaviour of co-teachers with each other reflects on their teaching behaviour in a class. A survey instrument *Co-teaching Relationship Scale* (CRS) was later developed by the researchers to estimate the extent of similarity of perceptions between co-teachers (Noonan, McCormick & Heck, 2003). Another instrument, *Co-teaching Rating Scale for Supervisors* (Gately, 2005) was used to informally gauge the effectiveness of co-taught classrooms emphasising areas needing attention.

As early as 1997, Norris highlighted that during co-teaching interactions, a significant progression in professional relationship occurs attributing it to the stages of *storming, forming and norming*. In the first stage of storming, both teachers respect each other's strengths and develop parity of roles and work collaboratively. In the second stage of forming, the co-teachers successfully overcome conflicts and develop a better understanding of each other leading to the final stage of norming where both work in synchrony and develop a particular style. This resonates with Murawski's (2009) idea of co-teaching as a "professional marriage" (p. 21). Believing that it takes a long time to develop confidence, faith and parity with peers, Murawski and Dieker (2013) advise administrators that "if you have a team in their first year, stepping on one another's toes but still growing in the process, leave them alone!" (p. 25).

The development of a co-teaching partnership through a somewhat similar three stage process, namely, the beginning, compromising and collaborating stage was reported by Gately and Gately (2001). In the beginning stage, the co-teachers might become acquainted with each other socially or professionally. As they would not be familiar with their roles and expectations from each other, the interaction is guarded and superficial to set up professional boundaries. While the communication is polite to maintain a civil and working relationship, this stage is often characterised by a clash of styles and lack of openness, communication and satisfaction. Nevertheless, this is the building block of a sound relationship. Conderman and McCarty (2003) concur asserting that interaction at this stage is superficial and guarded with boundaries; however, the objective is to develop a working professional relationship. In the compromise stage, a "give and take" occurs where co-teachers tend to build trust, communicate effectively, and collaborate on more honest opinions. The two partners share ideas, physical space and materials; they also develop respect and can often be seen introducing humour (Gately, 2005). This leads to the final stage – the collaboration stage – which is characterised by open and effective communication and interaction. After building trust, the co-teachers are able to read non-verbal signals and demonstrate effective collaboration by sharing roles as teachers and behaviour managers, position fluidly in the class and move the chalk freely between them. The *achieving symbiosis* theory was proposed by Pratt (2014) to explain how personal differences and strengths could be used to improve collaboration, leading to an effective co-teaching relationship. The model of 'achieving symbiosis' consists of three stages namely; initiation, symbiosis spin and fulfilment, which has similarities to other models

proposed in the sense that it starts with hesitation, then both partners analyse, reflect and then try to build a partnership.

As suggested by Tobin (2014, p. 193), a co-teacher should “step forward” and the other teacher “step back” if needed, thus providing support to facilitate effective student learning. Tobin (2014) argues that teaching together and being together will improve student learning and also help co-teachers to learn from each other’s praxis. However, he urged co-teachers to exercise caution in acquiring teaching behaviours that did not support student learning.

Effective co-teaching does not necessarily occur by assigning two teachers to a group of students in a classroom. An effective co-teaching approach is not *you teach, I teach*. Good co-teaching practice is collaborative, supportive and requires planning and an altered approach compared to solo or individual teaching. It draws on the strength of two individuals, requires good communication and an understanding of one another’s values and expectations. Crow and Smith (2003) strongly recommended co-teaching to enhance student learning and teaching effectiveness, especially to model interprofessional collaboration and provide professional development.

2.3 Strategies of Co-Teaching

Researchers in different educational contexts have proposed approaches to successful co-teaching in classes which more or less are alike but are different in the way they are perceived (Friend & Cook, 2007; Villa, Thousand & Nevin, 2004). Co-teaching approaches can be divided structurally according to the set-up of the individual classroom and the planning of the teachers involved. A variety of these approaches might be used in a single lesson. In a situation where co-tutors are placed together in the classroom, it may be that one strategy is required to introduce the content or concepts. Then later in the same lesson, the teaching moves to a different strategy when students are doing group work or any other assigned task. Both teachers could be at the front of the class and actively engaged in the delivery of the content or engaged with small student groups in different areas of the classroom.

Four approaches – supportive co-teaching, parallel co-teaching, complementary co-teaching and team co-teaching – were proposed by Villa et al. (2004, 2013). The parallel co-teaching approach has seven variations, namely: split class; station teaching; co-teachers rotate; cooperative group monitoring; lab monitoring; learning style focus; and

supplementary instruction. Each of these co-teaching strategies is similar in that each contemplates specific expertise of co-teachers and involves shared responsibilities, trust, communication, coordination and planning. However, stereotyping or labelling any one co-teacher as assistant or discipline police in front of students is to be avoided (Villa, Thousand & Nevin, 2008). Ideally, the co-teachers should swap their roles in different sessions with the same students.

Early on, five co-teaching models were acknowledged by Friend, Reising and Cook (1993) in an inclusion classroom, which along the continuum require more collaboration, planning, parity and trust. The models were: lead and support; station teaching; parallel teaching; alternative teaching; and team teaching. Friend (2008) later labelled six modified strategies of co-teaching. They are represented in Figure 2.1, illustrating the orientation of both co-teachers and students. Depending on the activities conducted or content taught in a particular teaching session, the co-teachers can choose any one or more strategies. Cook and Friend (2004) cite student characteristics and needs, teacher characteristics and needs, curriculum, and pragmatic considerations as four reasons to select a particular co-teaching strategy to be employed in a class. The co-teachers could swap roles and either could take on both roles. Each approach has its benefits and challenges and could be employed to enhance the learning environment. However, no one approach is superior to the other. Cook and Friend (2004) have explained the fine distinctions between all of the six categories as explained later.

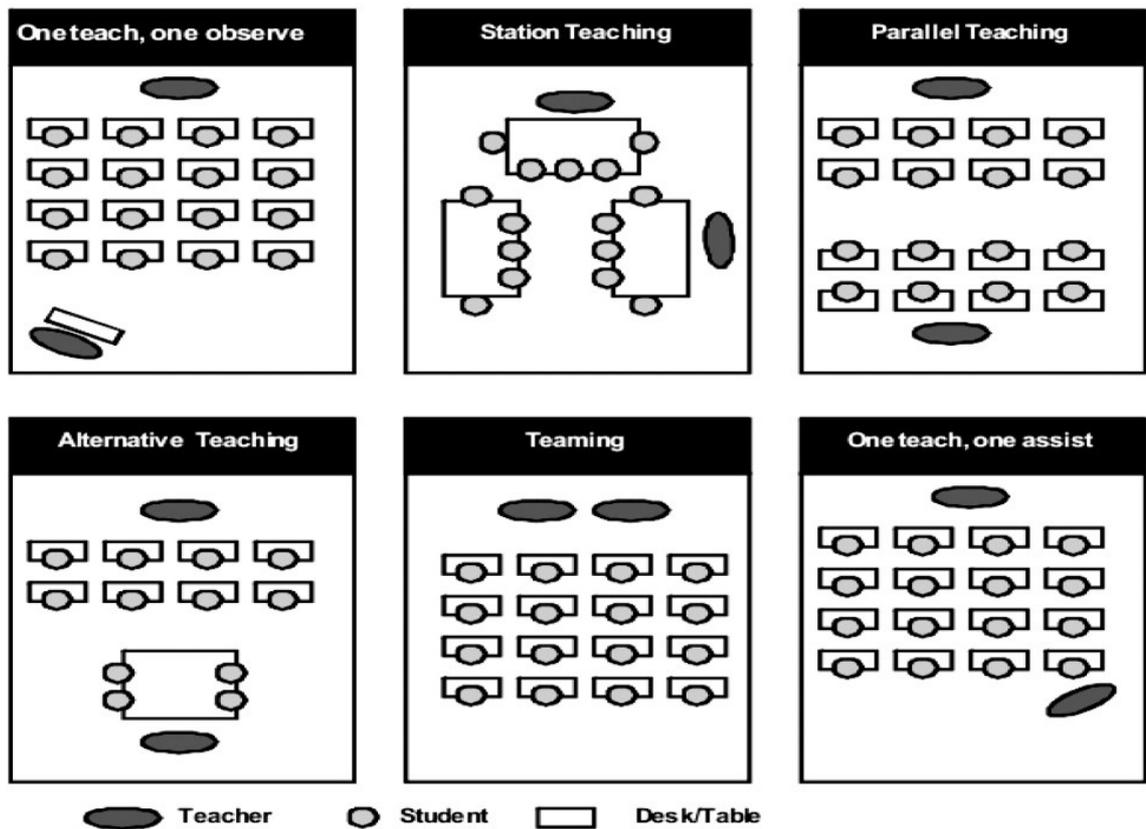


Figure 2.1 Various co-teaching approaches (adopted from Friend & Bursuck, 2009)

One teach, one observe: One teacher leads the instructional responsibility while the other teacher focusses on observational tasks. The role of the observing co-teacher could be to observe specific behaviours of students or the instructing teacher, or to collect some data on student learning, or provide feedback. This strategy is useful in training a pre-service teacher by providing useful feedback, or to understand the need for a specific instructional approach for special needs students, or to gauge students' capability, understanding and progress to alter teaching strategy and behaviours.

This approach needs advance planning to map out what and how to collect the data, make a rubric and then analyse the data to make sense of it (Cook & Friend, 2004). The challenge of this model is that the observing or non-active teacher is not considered an actual teacher by students and thought of as a person of lesser significance. However, with experience, co-teachers can observe each other and use the information for coaching (Cook & Friend, 2004).

One teach, one assist: Also referred to as “one teach, one drift” (Bacharach, Heck & Dahlberg, 2008, p. 11). In this teaching strategy, one co-teacher has the primary instructional responsibility whereas the other co-teacher assists the students unobtrusively, when required. The assisting co-teacher could be a novice teacher who

does not have an extensive knowledge of the content to be delivered, or is an expert in the topic to be discussed, or if the students need extra support during the learning process, or behaviour monitoring, or even in new co-teaching situations where co-teachers don't know each other well enough.

The advantages of this approach are that it is simple, requires limited planning, and provides additional support to students. Although limited planning is required for such sessions, students may question the authority of the other teacher. To overcome this limitation, attention should be given to ensuring that both co-teachers lead instructions at different times and assist in different sessions to be seen as equals by students.

Parallel teaching: To implement this co-teaching strategy, the two co-teachers split the class in half and each co-teacher teaches the same content simultaneously, using the same teaching strategy but can modify it to the students' needs. The students may or may not be randomly grouped (Karten, 2005). The advantage of this strategy is that the student-teacher ratio is reduced, providing students with more teacher attention and greater opportunities for participation in discussion or hands-on activities. This type of co-teaching strategy will be helpful in getting two perspectives of a particular topic e.g. merits and demerits of a health care policy followed by a discussion. Care should be taken not to categorize students while grouping especially in case of students with differing ability. Parallel co-taught sessions tend to be noisy so would require a better management plan.

Station teaching: In this model, the instructional material is split into small components and students are split into groups. All the groups have to work on each component for a specific time. The co-teachers move around these stations supporting student learning. This strategy works well in collaborative group work settings or laboratory sessions where the content is complex but not hierarchical (Cook & Friend, 2004). The students move around these stations to get exposure to the content at each table. This strategy requires more planning in organising stations. The students benefit by lower student-teacher ratio and integration of different ability students in a group. There are higher noise levels and disturbances during station movement. Co-teachers' communication and coordination to time the tasks is important.

Alternative teaching: In this teaching strategy, also referred to as "differentiated teaching", (Bacharach, Heck & Dahlberg, 2008, p. 11), one teacher takes instructional responsibility for most of the students in the class whereas the co-teacher gives

specialised attention to a smaller group. Alternative teaching finds its value when students have markedly different abilities and enhancement is sought. This strategy is suitable if some students need enrichment or remedial instruction. However, the alternative teaching strategy requires a lot of planning but it provides opportunity to all students to interact with the teacher. The deterrent to this strategy is stigmatizing students as exceptional students, under-achievers or over-achievers.

Teaming: This arrangement of co-teaching is considered robust and complex as it involves a lot of planning, preparation, collaboration and trust between the co-teachers. Both teachers share the instructional role and teach off each other. They are both seen as equals by students and they are both actively involved during the whole teaching time and feel free to interpolate any information. There is complete trust and respect in each other's capabilities. There is continuous interaction and engagement of both teachers with each other and the students. The baton passes seamlessly between the two while they bounce ideas off each other. Teaming has been reported to be a rewarding experience prompting participants to try new strategies. Many teachers are not comfortable co-teaching with others teaming early on because it requires a high level of trust, planning, commitment and understanding.

While the literature reports several versions of co-teaching strategies, different educational environments employ a single or a combination of a few strategies in one classroom. The supremacy of one strategy over the other has not been researched extensively (Kloo & Zigmond, 2008), but choosing any strategy depends on the context of the activity, the students and the learning environment.

2.4 Co-Teaching Contexts

2.4.1 Special Education / Inclusive Education

Concerns of parents' and educators' over disparities in the quality of education and outcomes of special education students led to federal and legislative changes. Reauthorisation of the *No Child Left Behind Act* (NCLB, 2001) policy and *Individuals with Disability Education Act* (IDEA, 2004) clearly addressed this issue in the United States that all children with special needs be taught by highly qualified teachers in a Least Restrictive Environment (LRE) with general students. LRE stipulates that children with disabilities be taught with their peers without disabilities to the maximum extent possible. The implementation of this law led to rapid progression of co-teaching in special

education, leading to reformed educational opportunities for special needs children (Friend & Cook, 2010).

An inclusive class is co-taught by a general education teacher (GET) and a special education teacher (SET). The roles of a GET and SET vary when teaching in a basic-skills class or a content-based class (Kloo & Zigmond, 2008). In a basic-skill class, the SET plays a pivotal role to teach content and skills needed and adapt the instructional environment for group or individual coaching. However, in content-based class, the role shifts to supporting, planning and observation.

A qualitative meta-analysis of co-teaching in special education by Scruggs, Mastropieri and McDuffie (2007) concluded that co-teaching is generally beneficial to both general and special needs students. The qualitative data also identified some conditions for a successful partnership like “planning time, compatibility of co-teachers, training, administrative support and appropriate student skill level” (p. 411). This study also emphasised on the drawbacks such as the subordinate role of special educators and suggested that the situation could be improved by professional development support. According to Rea and Connell (2005), co-teaching has led to collaboration between general and special education teachers resulting in adjustment of lesson plans, classroom management, student evaluation, professional communication and instructions to meet individual student needs.

Co-teaching not only benefits teachers by taking pressure off them to be a repository of content knowledge, but also supports students by providing expert subject knowledge coupled with specialised instructional strategies (Friend, Cook, Hurley- Chamberlain & Shamberger, 2010). In their review of models of co-teaching, Kloo and Zigmond (2008) suggested that co-teaching improves the academic performance in language, arts, maths, science, and social studies of special needs children; and also increases their social acceptance and social competence (Rea, McLaughlin & Walter- Thomas, 2002). Furthermore, Villa, Thousand and Nevin (2004) claim co-teaching benefits not only students in terms of academic improvement but also teachers with regard to professional growth in various ways, leading to improved job satisfaction.

Co-teaching seems to be an effective strategy in special education, catering not only to general and special needs students but also to general and special education teachers. However, the literature warns administrators and educators to be careful in its implementation and ensure proper planning and training.

2.4.2 Pre-Service Teacher Preparation

In general, teacher preparation programmes are conducted at colleges and universities using traditional methods of teacher training with the support of cooperating teachers. A shift in teacher training schema from “mastering skills, techniques and methods of teaching” (Cornu & Ewing, 2008, p. 1801) to “more shared learning and joint construction of what it means to teach” (p.1803) calls for a shift in teacher training from traditional to co-teaching. Co-teaching provides support to novice teachers to develop effective teaching skills in the real classroom, with the support of a co-teacher. In the teacher education context, co-teaching developed as a plausible method for teacher education from the observations and experiences of Roth in the early 1990s. Co-teaching as a pedagogical approach assists a student teacher and a cooperating experienced teacher to co-participate in all the processes of teaching, including co-planning, co-delivering the content, co-assessing and providing feedback together. The concept of co-teaching as a teacher education pedagogical approach has gained momentum and is now used in many educational institutes (Bacharach et al., 2010). Co-teaching provides opportunities for novice teachers to develop into better teacher educators who are reflective, professionally rigorous, and have a sound understanding of curriculum and practice (Gallo-Fox & Scantlebury, 2016).

Most of the research studies focusing on teacher training using co-teaching have been based on Lave and Wenger’s (1991) community of practice. Co-teaching attempts to create an environment that allows all the participants (co-teachers) to promote positive relations and authentic participation (Lave & Wenger, 1991). Exposure to best practices and authentic field experiences emphasises active and mutual engagement of the teacher trainees. Earlier, Greene and Issacs (1999) reported that college professors neither modelled nor had any experience of co-teaching which led to a gap in pre-service teachers’ understanding of exemplary co-teaching practice. Implementation of transition to co-teaching model to train student teachers at Whitworth University in Spokane, Washington (2009) revealed its perceived benefits to all, students, student teachers and mentoring teachers. The study revealed that co-teaching improved student achievement, providing them with quality instructions, prepared student teachers for the new collaborative learning environment, and professional development to teachers (Darragh, Picanco, Tully & Henning, 2011).

Roth (1998) perceived co-teaching as a teacher education program where beginner teachers co-participated and shared roles with experienced teachers in all aspects of

running an effective classroom. This approach provided opportunities for the professional growth of both teachers (Tobin & Roth, 2005). Roth and Tobin (2002) developed the practice of co-teaching to help pre-service (K–12) teachers develop their tacit knowledge necessary to be successful teachers. Co-teaching has not only developed as a form of effective instructional technique to make the most of the knowledge and expertise of two or more teachers but also as a way of learning to teach, doing research, supervising new teachers, and evaluating teaching in classrooms (Gallo-Fox, 2009; Roth, Masciotra, & Boyd, 1999; Roth & Tobin, 2007). Bacharach et al. (2010) reported the positive impact of co-teaching on learners, teacher candidates and cooperating teachers thereby increasing teaching resources for all (Roth, Tobin, Carambo & Dalland, 2004).

Co-teaching has not only found its significance in teacher education programmes for pre-service teachers, but has also successfully stimulated in-service teachers to improve teaching. Roth and Tobin (2002) have linked co-teaching experiences to Bourdieu's (1990) perspective of habitus which refers to the development of habits and skills as a result of life experiences. Beers (2005) reported that she learnt effective and meaningful student engagement by observing the instincts and habitus of her co-teacher. Murphy and Beggs (2010) further argued out that co-teaching provided development of teachers since both teachers brought their own "specific expertise to the lesson" and learnt "without even attempting to do so" (p. 12). During this symbiotic process of learning from each other, the co-teaching strategy provided an opportunity for a "dialogical process that draws on reflective practice as a mechanism for making unconscious practice explicit" (Scantlebury, Gallo-Fox and Wessell, 2008, p. 971). Such interactions encouraged learning communities which share responsibility for teaching and learning for the educational requirements of students.

Co-teaching also supports learning through experiences by interacting with other participating teachers. The enabling process commences with the interactions beginning from the margin, and then gradually leads to the epicentre of a learning experience (Lave & Wenger, 1991). If such interactions are lacking, it might limit the participants' learning experiences.

Tobin's (2006) extensive work in improving science learning in inner city high schools on the east coast of the United States has shown that co-teaching and co-generative dialogue not only helped the science teachers to develop their pedagogical praxis, but also improved teaching behaviour and interactions with the students. As a collaborative process, co-teaching improves interprofessional contacts (Vance, 2001) and helps

teachers improve their pedagogical praxis which can thus improve student engagement and achievement (Bacharach et al., 2008).

A significant avenue of acquiring knowledge or skill is through observation, imitation, and modelling (Bandura, 1977) which stimulates further research to investigate learning through social engagement. Similarly, Lave and Wenger (1991) found that social participation within authentic contexts, where members of a group share information and experiences, provides an opportunity for members to develop both professionally and personally. Furthermore, a considerable amount of literature published on co-teaching examines studies in socio-cultural perspectives (Gallo-Fox, Wassell, Scantlebury & Juck, 2006; Murphy & Beggs, 2006; Roth & Tobin, 2006) ranging from a theorist's perception (Bandura, 1977; Lave & Wenger, 1991) to a more practical classroom setting (Friend & Cook, 2010; Gallo-Fox et al., 2006; Murphy & Beggs, 2006). Such social interaction between the members of the group leads to the formation of communities of practice (Wenger, 1998). In a co-teaching context, novice or inexperienced co-teachers, co-teachers from diverse disciplines, and backgrounds form a community of practice (Wenger, 1998).

Wenger (1998) summarised mutual engagement, joint enterprise and shared repertoire as key aspects of a community of practice. These findings are similar to the terminology used to explain co-teaching as shared responsibility of preparation, instruction, assessment and feedback conceived by Friend and Cook (2010), Murphy and Beggs (2006) and Tobin and Roth (2005). Student teachers report a gap between the theory of teaching practice and the reality and demands of actual classroom (Roth, Lawless & Tobin, 2000). However, co-teaching provides an environment where pre-service teachers engaging through the theoretical framework of a community of practice (Lave & Wenger, 1991), grow by being exposed to the habitus, “a system of structured and structuring dispositions that helps one to act appropriately in diverse contexts” (Roth, Lawless & Tobin, 2000, p. 2). The teaching practice of a novice co-teacher evolves by making conscious informed decisions than merely following observed practices (Roth & Tobin, 2005). Therefore, teacher education programs that provide field experience to pre-service teachers through co-teaching should plan effectively to coordinate enough opportunities to the student teachers for the holistic process of teaching that includes planning, instruction, assessment and reflection.

The outcomes of co-teaching vary in the context of its use. As reported by various researchers, co-teaching facilitates “learning to teach or to become better at teaching”

(Roth & Tobin, 2002, p. 189), or “learning from each other” (Murphy & Scantlebury, 2010, p. 1), or “achieving what none could have done alone” (Wenzlaff et al., 2002, p. 14). Tobin and Roth (2005) elucidate the essence of co-teaching as sharing responsibilities of planning and implementation of teaching process rather than load sharing.

York-Barr, Bacharach, Salk, Frank and Beniek (2004) proposed the implementation of co-teaching in university-based teacher preparation programs to effectively cultivate the exemplary collaborative skills in pre-service teachers. In their study of co-teaching of a pre-service education course, Bacharach, Heck and Dahlberg (2008) reported positive responses from both faculty and students. The few drawbacks reported were addressed which helped to strengthen the workshop.

Conderman and McCarty (2003) co-taught an Inclusions Strategies course and voluntarily selected 30 secondary general education teachers (seniors and juniors) to educate them in teaching in inclusion classrooms. The participating teachers indicated that this collaboration provided them with an opportunity to share their teaching experience with each other, reflect and immediately implement any modifications needed in the teaching strategy or assessment tool rather than to wait for an end of session reflection. Similar views were reflected by Tobin (2014), suggesting that co-teaching allows participants “to learn from one another by being with one another and experiencing one another’s praxis as it is enacted” (p. 194).

2.4.3 Professional Development

Teacher professional development aims to improve teachers’ skills and competencies for better student learning outcomes (Hassel, 1999). Research in teacher professional development has led some (Elmore, 2004; Hirsh, 2006) to suggest strategies to improve the delivery of such programmes. The emphasis is more on active involvement of learners to engage in hands-on experiences rather than passively learning skills (Clarke & Hollingsworth, 2002). As discussed below co-teaching has found its use in professional development of teachers and educators who are involved with learners in different fields. Moreover, their experience of co-teaching has resulted in their own professional growth as discussed in subsequent case scenarios.

When co-teaching an undergraduate reading methods course to exemplify the practice of co-teaching to students, Ferguson and Wilson (2011) experienced an actual understanding of the endeavour and hence improved their own knowledge and experience of co-teaching. This experience helped them to understand the impact of power and expertise

on any collaborative interaction. They also acknowledged that co-teaching provided them with professional development through continuous feedback and reflection and strengthened their own co-teaching understanding. After analysing their reflective journal, both researchers reported an early reluctance to co-teach because of the anxiety of being judged by the other. However, towards the end of the semester both realised the power of co-teaching when their self-consciousness gave way to a “more inclusive and dynamic model of transformative, collaborative, collegial instruction” (p. 62). The researchers became more reflective and supportive by learning from each other.

A similar finding was observed in a co-teaching model where physicians and clinicians with different levels of experience taught and supervised medical students (Orlander, Gupta, Fincke, Maning and Hershman, 2000). The researchers found that co-teaching enhanced teaching skills and decreased anxiety. Their findings of the research suggested that the senior faculty who sought to gain a fresh insight into teaching with others achieved the outcome. Additionally, the junior faculty learnt faster by doing, reflecting and altering their behaviour under guidance of more experienced practitioners. Although they found that the process was labour intensive and time intensive, but the gains in terms of professional training and learning by the faculty were significant. Their model was based on a 4-step process of orientation, teaching encounter, debriefing and planning. They concluded that the success of such a faculty development programme was dependent on collaboration between the participating faculty and how well they could manage power relationships. Furthermore, patient care is becoming increasingly challenging and diverse, highlighting the need for interprofessional education in medical and other health professions. There is a suggestion that co-teaching can be used as a “stimulating experience” to train educators in interprofessional medical education (Barr, 2002, p. 191).

2.4.4 Higher Education

Co-teaching is being used in the tertiary education sector at undergraduate, postgraduate and doctoral levels in addition to pre-service teacher education. The literature reveals that co-teaching in higher education not only benefits students but also positively impacts co-teaching faculty (Bacharach, Heck & Dahlberg, 2008). Co-teaching develops better student content knowledge (Dugan & Letterman, 2008), enhanced professional practice (Crow & Smith, 2003), specific skill development, improved student experiences and retention (Ferguson & Wilson, 2011) which is also evidenced by the following discussion.

Highlighting the diversity in learning environments, increased student expectations, and the multiplicity of learning and assessment tasks in higher education institutes, Bess (2000) suggested it might be better that teaching roles be played by multiple people. This proposition supports the use of co-teaching which brings together co-teachers who possess varied teaching and educational backgrounds, different instructional and assessment strengths and professional expertise along with rich life experiences that enrich the teaching-learning process for both students and teachers involved.

In a first year university urban and regional planning unit, Turkich, Greive and Cozens (2014) paired an educational-focused researcher with an experienced academic with no prior teacher education. In their practice report they described that co-teaching used as a mentoring model not only improved student retention (around 10%) and student satisfaction (from 94.9% to 98.7%) but also mentored the academic colleague with specifically adapted new teaching approaches and experiential learning. The interaction also created awareness of the mentee about the underpinning philosophies, effective course design, delivery modes and assessment strategies.

In another case, a new pedagogical standard has been presented by Yalon-Chamivitz, Kraiem and Gutman (2017) by incorporating a client (an occupational therapy user) as the co-teacher with an occupational therapy educator. The researchers reported that such collaboration led to strengthening authentic, collaborative and sound professional practice that broadened the professional perspectives and respect for various viewpoints.

In order to develop their own professional identities, two social work doctoral students embarked on a social experiment to co-teach (Chanmugam & Gerlach, 2013). They reported that the experience not only enhanced their self-efficacy but also was “intellectually stimulating” (p. 116). The authors had hoped for a reduced workload but due to deep engagement and involvement, their goal was not met. A similar study by Baltrinic, Jencius and McGlothlin (2016) found that when doctoral students in a counsellor education program were exposed to a co-teaching experience, they not only developed their effective teaching skills, but also helped them to build confidence under the guidance of more experienced faculty members. The participants also built positive relationships with their faculty members which developed progressively, preparing them better for their future teaching roles.

With the support of each other, Rabidoux and Rottmann (2017) co-taught a fully online graduate course (unit) to reduce stress and fatigue of solo teaching and generate diverse

knowledge in the course content. Such collaboration also addressed the issue of lack of institutional support for professional development. The experience led to increased content knowledge while establishing a supportive academic environment that reignited their passion for teaching. Though challenges arose, with each other's support and open communication, the authors were able to resolve them and learn from such situations.

Co-teaching is also useful in developing some key employability skills in the workplace. Building teamwork, perceived as an important skill in the workplace, was taught by Kliegi and Weaver (2014) through co-teaching a business administration unit. The authors co-taught two sections of the unit and eighteen sections without co-teaching. The assessments were modified to collect feedback on students' co-teaching experience through reflective writing and guided discussion. The students responded positively to co-taught sessions having developed mutual respect for peers and conflict resolution. The students also developed appreciation for the value of communication and effective teamwork leading to improved quality of work.

With an aim of integrating theoretical and practical aspects of auditing to better train students for the workplace, a New York University academic in accounting co-taught an auditing unit with the partner of an accounting firm (Brown & Lint, 1982). The students benefitted from this service delivery option by attaining a comprehensive understanding of audit philosophies and day-to-day operations in a current workplace situation. Both co-teachers learnt from each other the basic philosophies and the implementation of those philosophies in practice. Each of the stakeholders in this situation (students, academic and partner) learnt about challenges and difference of opinions encountered in each other's field of work and the respect for such difference of opinions.

Similarly, Hohenbrink, Johnston, and Westhoven (1997) reported the positive impact of health care academics co-teaching with practitioners on student learning to better relate theory with practice. Crow and Smith (2003) modelled interprofessional collaboration to teach a multidisciplinary undergraduate cohort through co-teaching in class. They reported that by using co-teaching they created an environment where they could demonstrate to students visually how interprofessional collaboration could be achieved. The students reported positive feedback about the interaction and their learning experience.

2.5 Perceptions of Co-Teaching

Theoretically, co-teaching appears to be a viable solution to teaching in large and diverse class-rooms. Rather than assuming that the pedagogy is working effectively, educators' and students' perceptions and experiences have been collected and analysed in the literature to provide an overall perception and to identify strengths and challenges of co-teaching in these contexts. Various strategies have been used to collect data from surveys, focus group interviews, individual interviews, reflective journals and best practice checklists. The literature has abundant studies advocating benefits of co-teaching to students and educators alike, but there are reports of some challenges encountered in implementing co-teaching in classes. Research also suggests that if some of the challenges encountered could be addressed, co-teaching would be more effective. Specific examples are discussed in the proceeding discussion.

Reinhiller (1996) reviewed ten articles of co-teaching involving inclusive education and reported the outcomes from students' and teachers' perspectives. The teachers reported instructional improvement, renewed enthusiasm and energy, and better instructional planning and communication, but also felt challenged for time to plan, increased workload, unequal participation, and ethical and professional issues. However, it was assumed that lack of parity leading to unequal participation could be due to involvement of general and special education teachers. This was not the case; improvement in student attitudes and similar performance by all students, with or without special needs, was also reported in these studies.

2.5.1 Positive Aspects of Co-Teaching

The practice of co-teaching generally employed in K-12 educational settings and teacher education programmes in universities is considered an effective instructional technique. This pedagogical approach greatly benefits student learning by merging knowledge and expertise of two teachers teaching in the same classroom (Darling- Hammond & McLaughlin, 1995, Roth et al, 2004), and who usually specialise in different fields of knowledge (Anderson & Speck, 1998). Hohenbrink et al., (1997) reported a variation where academics and practitioners could co-teach combining theoretical knowledge and professional practice for better student outcomes and employability. In higher education, co-teaching is mainly employed in teacher preparation programs where a diversity of knowledge, experience, expertise and perspectives of two different teachers can be explored with the next generation of teachers (Kloo & Zigmund, 2008). Anderson (1991)

suggested that both students and lecturers benefit by collaborative teaching and the benefits grow as the relationship matures (Hourcade & Bauwens, 2003). Murawski and Hughes (2009) argue that all students and co-teachers benefit in the collaborative process of co-teaching.

2.5.1.1 Benefits to Co-Teachers

In this section, perspectives of teachers regarding benefits of co-teaching are discussed. These viewpoints represent opinions gathered in different co-teaching contexts such as inclusive education, teacher education, primary or secondary schools, professional development or higher education. The co-teachers regardless of the student cohort benefit immensely from the collaborative interaction. Co-teaching is a powerful relationship that can provide an enriching experience for both co-teachers involved. If a co-teaching partnership works well, the literature has reported numerous benefits. Further discussion explores the significant benefits encountered by teachers during their co-teaching experiences.

Reinhiller (1996) highlighted the benefits to the teachers engaged in co-teaching in inclusive education classrooms. Close interaction of Special Education Teacher (SET) and General Education Teacher (GET) improved the instructional approach by learning various aspects from each other, especially student management, questioning technique, timing and evaluation. Sharing joint ownership of class and students transformed the interaction between cooperating teachers from simple exchange of ideas to more professional accommodating discourse for better student learning. The presence of another adult to share ideas and provide suggestions resulted in renewed energy and enthusiasm. Two adults together in a room also resolved the issue of arranging additional support for students who were low achievers. Teachers reported intellectual stimulation and improved teaching ability which led to a sense of community.

Co-teaching is an “intellectually stimulating” (Chanmugam & Gerlach, 2013, p. 116) experience which enhances teaching effectiveness. Conderman and McCarty (2003) found that during co-teaching interactions, both co-teachers could discuss ideas and enrich their content, intellect and pedagogical knowledge and thus evolve and make changes to their teaching behaviours. Such exchange of knowledge in a setting where both co-teachers are seen as significant equals, can share ideas and treat each other with respect creates a learning community (Scantlebury et al, 2008).

The healthy collaborative interaction and discussion between two co-teachers creates a dynamic and interactive learning environment (Gaytan, 2010) where students also feel safe to discuss differing opinions. However, it becomes the responsibility of co-teachers to create such an engaging environment by modelling appropriate behaviours. During these interactions, co-teachers share knowledge and experience leading to enhancement of expertise, insights and resources through peer learning (Carlisle, 2010; Scantlebury et al., 2008).

Teacher education and training programs that have integrated co-teaching in their practicum classes reported benefits like learning from various experts while working in real classroom situations that provided more authentic learning opportunities. Being exposed to a variety of teaching styles eventually connects to different student learning styles (Hwang, Hernandez & Vrongistions, 2002). Several studies found that exposure to teaching practice during practicums improved confidence and made the transition to taking full responsibility in actual classrooms easier (Murphy & Beggs, 2005, 2010; Roth & Tobin, 2002; Scantlebury et al., 2008). Student teachers exposed to diverse teaching styles and pedagogical practices considered that their own pedagogical practices improved (Dugan & Letterman, 2008) and their teaching identity grew and developed (Roth & Tobin, 2004). Birrell and Bullough (2005) monitored ten student teachers who were trained in collaborative pairs and reported that the participants experienced increased levels of confidence, and built trust with one another. These interactions initiated greater satisfaction, helping them to be confident teachers. Building trust and confidence provides co-teachers with opportunities to take risks and emulate best practice that they have encountered in their own classes when observing their co-teaching peers (Gallo-Fox, 2010; Murphy & Beggs, 2010).

Co-teaching promotes shared responsibility and accountability (Friend & Cook, 2007) and reduces burnout and exhaustion (Weiss & Brigham, 2000). Co-teachers reported that having two teachers in the class provided them with another person to manage behaviour problems of students and set an example by modelling proper learning behaviours for students (Birrell & Bullough, 2005). Having another professional in the class-room provided flexibility and confidence to use teaching strategies (Condermann & McCarty, 2003) that one would not have used if solo teaching, a finding also supported by Roth and Tobin (2004).

Co-teaching allows two professionals to form a collaborative and cooperative interaction exchanging ideas and strategies leading to professional growth and pedagogical

repertoire (Bacharach et al., 2010; Gallo-Fox, 2010; Scantlebury et al., 2008). Furthermore, as the interaction is ongoing, the suggestions and modifications can be applied immediately on a continuing basis producing an immediate effect. Crow and Smith (2005) reported that reflective discussion after each co-teaching experience transformed each co-teacher's understanding of collaboration and evolved their own co-teaching practice. Chanmugam and Gerlach (2013) also attributed co-teaching peer feedback process to providing a "readily accessible supportive process for reviewing" (p. 114) that would lead to personal development and enhanced teaching skills and competence.

Crow and Smith (2003) also acknowledged that while experimenting with interprofessional co-teaching, they realised how their collaboration increased trust, self-awareness and reflexivity with the continuous constructive feedback exchange. Ferguson and Wilson (2011) discussed that initially teaching with another expert is daunting but as the collaboration builds up, it transforms into a symbiotic learning experience. Both co-teachers benefit in content and pedagogical knowledge during co-teaching experience. It also rejuvenates teaching enthusiasm and revives some of the strategies that are often overlooked with time. O'Conaill (2010) greatly appreciated the support co-teachers provide to each other comparing it to "a sense of having a safety net" (p. 184). Ferguson and Wilson (2011) emphasised that co-teaching should be implemented in higher education to "allow professors to grow, reflect and change" (p. 66). Teaching with another in the same teaching space creates more opportunities to develop professionally (Austin, 2001) without formal professional development training.

2.5.1.2 Benefits to Students

The research literature also reports the benefits recognized by students in a co-taught environment. Whether the learners are students in a school or institutes of higher education, special needs children, pre-service teachers or professionals, research reports the benefits across the board among the students. Walther-Thomas (1997) found an improvement in self-esteem and social skills of special needs students in co-taught classes. Scruggs et al., (2007) reported an overall benefit for students in academic and social contexts while experiencing co-teaching.

In their pilot study to provide Continuing Professional Development (CPD) to qualified nurses, Kerridge, Kyle and Marks-Maran (2009) summarised their findings by stating that the students perceived collaborative teaching to be worthwhile. The positive themes that emerged were differing/multiple perspectives (50%), positive impact on group work

(25%), cognitive development (20%) and, to a lesser extent, learning about inter-relationships (5%). This data not only reflects the benefit achieved towards content knowledge and cognitive growth but also on skill development.

Some of the studies (Bacharach et al., 2010, Carlisle, 2010, Gallo-Fox, 2010; Tobin & Roth, 2005) have reported increased student attention attributed to active engagement by the two teachers while co-teaching. Students also have reported increased engagement and better learning outcomes in co-taught classes (Dugan & Letterman, 2008; Ferguson & Wilson, 2011; Roth & Tobin, 2004). Better student learning is also attributed to multiple ways of explanation by co-teachers (Bacharach et al., 2010). Condermann, Bresnahan and Pedersen (2009) reported that by organising well-planned teaching stations, students were able to construct their own knowledge independently and they also appreciated the effort involved in creating that experience.

Another benefit is higher teacher-to-student ratios (Bacharach et al., 2008; Cook & Friend, 1995; Villa, Thousand & Nevin, 2004). With fewer students to manage, teachers find time to support individual student learning and thus students have more access to the teacher as a resource (Bacharach et al., 2010; Carlisle, 2010, Gallo-Fox, 2010; Tobin & Roth, 2005). Students reported receiving increased attention by teachers and responses to their queries in a timely manner (Birrell & Bullough, 2005). By improved interaction with students due to the presence of two teachers, increased student learning and building of significant connections was observed (Birrell & Bullough, 2005). Dieker (2001) reported a reduction in negative behaviours in co-taught classes which could be because of the availability of another pair of eyes and hands.

Various research studies report that co-teaching benefits teaching and learning by allowing teachers to present content differently, scaffold and monitor student learning and behaviour, enabling overall student growth and development (Ferguson & Wilson, 2011; Simpson, Thurston & James, 2012). K-6 students showed a statistically significant improvement in reading and maths than students who were not co-taught when exposed to co-teaching by cooperating and teacher candidates (Scantlebury et al., 2008).

Co-teaching as a teacher education model creates awareness in pre-service teachers of the diversity in learning environments and the needs of a wide variety of students. The teaching approach also emphasises the need to know and understand pedagogical strategies to deal with such diversity. Moreover, the importance of cross-disciplinary interaction, constructive and reflective feedback, building flexibility and trust and overall

sharing of roles and responsibilities in managing a classroom effectively are also highlighted (Chanmugam & Geralch, 2013; Kluth & Straut, 2003).

2.5.2 Challenges of Co-Teaching

The literature is resplendent with reports appreciating co-teaching for its benefits to teaching and learning. But, there are challenges for successful implementation that require hard work, commitment and perseverance to accomplish an effective co-teaching experience (Friend & Cook, 2010). The literature revealed a significant number of studies reporting challenges encountered by teachers in different educational contexts while co-teaching, but very few studies explore student challenges. Hence a general view of challenges of co-teaching has shown that there was a gap in literature that could perhaps be filled with this research to understand challenges encountered by students in a co-taught classroom.

2.5.2.1 Challenges for Co-Teachers

Friend (2008) highlighted the need to address the challenges for effective co-teaching to improve student outcomes. Some of these challenges are expected (Conderman, 2011) prior to embarking on co-teaching journey, but some are unexpected and arise in class during instruction (Gately & Gately, 2001). A challenge consistently reported across the literature researched was lack of planning and common planning time (Cook & Friend, 1995; Villa et al., 2004), followed by lack of pre-service and in-service teacher development opportunities (Liu & Pearson, 1999). The other challenges reported were: building positive working relationships between co-teaching partners, clarifying roles and responsibilities and ensuring administrative support (Friend, 2008).

Common planning time is a vital factor for the success of a co-taught class. In all contexts of co-teaching, finding a common time to plan the lessons was a prominent challenge (Carlisle, 2010; Murawski & Dieker, 2008; Scantlebury et al., 2008). Planning how the lesson would be delivered avoids repetition of information and overlap of duties (Villa et al., 2004) thus avoiding any confusion. Unless the roles of each partner are clearly discussed and played, the students do not see them as equals which undermines each teacher's authority. Defining the roles of co-teachers while co-teaching creates parity between the two (Brenan & Witte, 2003) and prompts active involvement of both co-teachers at all times. Furthermore, if not planned well, one teacher might feel overworked and the other underappreciated (Cook & Friend, 1995). The participants in a study by Gallo-Fox and Scantlebury (2015) reported that it was not all 'daisies and sunshine' when

the co-teachers failed to prioritise and complete tasks in a timely manner leading to reduced co-respect.

Similar findings were reported by Fleming (2007) in her study exploring views of middle to high school level co-teachers in Washington County schools highlighting the factors that impacted the success of a co-teaching relationship. The participants reported that lack of common planning time, little or no pre-service and in-service training, unequal sharing of teaching responsibilities and an assigned co-teaching partner (rather than voluntarily choosing the partner) negatively impacted on their experience of co-teaching.

Balance of 'power' is another apparent challenge in a co-teaching partnership especially if one co-teacher holds a higher rank or has more experience. The research study by Ferguson and Wilson (2011) reported that a power struggle was dominant in their reflection as co-teachers in the beginning. Both struggled to balance power effectively which was also felt by students as to who was in charge. But gradually, co-teachers learnt to share the authority and power and use it to exemplify collaboration and even enjoyed the experience of sharing the responsibility. Parity and control are also reported as a barrier to successful co-teaching in other studies (Cook & Friend, 1995; Dieker & Little, 2005; Murawski & Swanson, 2001).

The personality and personal views of two individuals are important in shaping the co-teaching relationship between the co-teachers. Letterman and Dugan (2004) indicated that co-teachers may hold different thoughts and a belief regarding what is the key objective of learning in a session. Their teaching styles and philosophies may not match (Bouck, 2007; Paulsen, 2008). The challenge, though, is to bridge these differences harmoniously to create a well-balanced learning environment for holistic learning outcomes. They also emphasise the significant relationship between these differences and conflicts of opinions of teachers in creating learning experiences for students to develop their own points of view.

Co-teaching is successful and effective only if both co-teachers interact during the process of teaching such as planning, delivery and reflection (Crow & Smith, 2003). If the collaboration is effective, co-teaching produces positive experiences for both, the teachers and the taught. If the co-teachers concede to their ego and authority and are not interested in sharing and collaborating, then it becomes a challenging experience. The interpersonal interaction between the co-teachers might depend on various factors. Friend (2011) identified teacher compatibility and willingness to collaborate, defined roles and

responsibilities, shared decision making and accountability, and mutual goals as critical factors to facilitate a collaborative interaction.

Although it has not been comprehensively researched, in certain educational contexts gender differences might have a potential effect on co-teaching partnership (Metcalf & Linstead, 2003). A teacher brings his/her own distinctive personality to the co-teaching partnership (Rushton, Morgan & Richard, 2007) and if sincere effort is made to understand each other, the relationship and work performance improves (Duhe, 2009). However, such interpersonal differences can create mistrust and conflicts, thereby, negatively impacting on collaboration between the co-teachers (Friend & Cook, 2010; Stevensen, Duran, Barrett & Colarulli, 2005). Hence there is a need to address such issues. Communication, styles of communication and their interpretations are also important elements in maintaining a healthy co-teaching interaction (Conderman et al., 2009; Ivanov & Werner, 2010) because miscommunication can lead to conflicts.

Limited or lack of training of co-teachers to co-teach is reflected by inadequate conceptual understanding and ignorance of implications for co-teaching. Consequently, the research literature suggests that pre-service and in-service training is critical to effective co-teaching practice (Scruggs et al., 2007). Pancsofar and Petroff (2013) found a positive correlation between teacher training and teacher confidence, higher levels of interest and positive attitudes towards co-teaching in both, pre-service and in-service teachers. A misconception is that collaboration comes naturally because it is a learnt skill. This is not the case because investment of time and effort are required for collaborative skills to be achieved and perfected (Friend, 2000). Also, the training and investment of time to be successful contradicts the popular belief that the workload of teachers is reduced or that co-teaching saves time (Chanmugam & Geralch, 2013).

Tobin (2014) emphasised the importance of teacher's willingness to adopt co-teaching and be comfortable with a peer, build trust, respect and flexibility to try new pedagogical approach (Chanmugam & Geralch, 2013). The smooth adjustment between the roles of the two co-teachers, their teaching styles and philosophies is integral to success of a co-teaching pair. However, in higher education institutions, power, ownership of the course of study, ego, and teaching evaluation impacting on tenure can influence the willingness to co-teach with other peers (Good, Davis, Maguire & Roehl, 2014). Lusk, Sayman, Zolkoski, Carrero and Chui (2016) present an interesting challenge to co-teaching especially in higher education institutions by questioning the legitimacy of a course taught by two instructors because, traditionally, there is only one instructor. So it becomes

significant to justify the use of co-teaching and the presence of two teachers in the classroom before starting a course.

Discussing ethical dilemmas in implementing co-teaching as a model to educate pre-service teachers, discussion between teacher educators and researchers in the field highlighted issues (Gallo-Fox et al., 2006; Murphy & Beggs, 2006) such as co-teachers, educators and researchers having different philosophical perspectives, choosing not to enact co-teaching when not observed and researchers disregarding discussion with all stakeholders (Gallo-Fox et al., 2006). Quoting Gable, Arllen and Cooke (1993), Reinhiller (1996) discussed ethical and professional issues that could adversely affect co-teaching. The dilemma that co-teachers face is whether or not to report aggressive behaviour of a teacher towards students or accuracy of implementation of special teaching strategy for a particular group of students.

To overcome most of these issues, Murphy and Beggs (2006) suggested having an open dialogue with all stakeholders to possess joint ownership and accept and respect the diverse perspectives and willingness to consent to co-teaching. The key to co-teaching is teaching at the elbow of another (Roth & Tobin, 2002) rather than stepping on each other's toes (Murphy & Beggs, 2006).

2.5.2.2 Challenges for Students

Students, when co-taught, have reported encountering challenges mainly referred to conflicts arising between the co-teachers in the form of difference of opinions, grading, teaching styles, communication, expectations, inefficient time management or content delivery (Ferguson & Wilson, 2011; Graziano & Navarrete, 2012). After experiencing co-teaching, student teachers anticipated conflicts in actual teaching situations (Vogler & Long, 2003) that arose for class control, management and discipline.

In a higher education context, Ferguson and Wilson (2011) found that students struggled with the power relation between the two co-teachers coping with the idea of two teachers, graders or administrators. Waters and Burcroff (2007) (as cited in Graziano & Navarrete, 2012) expressed similar views that the students expressed suspicion of the co-teaching process when two educators shared a classroom on a daily basis. The students doubted the efficiency of teachers to teach independently.

Bacharach et al. (2008) highlighted the challenges encountered by students in a co-taught classroom when poor organisation of the teaching time led to unbalanced instruction time. Hence, students felt confused about the authority figure in the class and did not

know who to go to. The students were also wary of the grading of their work because they were not sure if both teachers would critique their work and that might impact on their final grade. Poor communication and collaboration resulted in inadequate organisation creating confusion among students for course expectations (Dugan and Letterman, 2008).

2.6 Fundamentals of Successful Co-Teaching

A co-teaching team consists of two members who share a common goal of educating students. To create a positive experience for both teachers and students, co-teachers need to engender cooperation, communication and collaboration to maximise their strengths and work on their weaknesses. The effectiveness of any teamwork depends on various factors as it is intellectually, emotionally and psychologically demanding. Like any other relationship, a co-teaching relationship also needs time, patience, trust and respect to nurture and does not happen automatically by putting two teachers in a classroom together. Various individual research studies have elucidated the supporting and constraining factors in the development of effective co-teaching relationships.

In exploring co-teaching with pre-service teachers in South Korea, Murawski and Nussli (2017) reported that open and honest communication, willingness to provide regular feedback and accept it constructively, openness to learn from less experienced, mutual trust and respect, and personal compatibility were key factors in the success of a co-teaching partnership. However, when there is an incompatibility in personalities, teaching goals, planning, lack of trust, parity or feedback, it jeopardised the positive relationship – “When done well co-teaching is an effective way of providing instructions to a diverse group of students” (Gately, 2005, p. 40).

Key factors that play a significant role in an interprofessional/multidisciplinary team dynamic are willing participation, shared responsibility, planning and decision making, contribution to expertise, shared power on knowledge and expertise, and a non-hierarchical relationship (Nancarrow, Booth, Ariss, Smith, Enderby & Roots, 2013). Similarly, Minnett (1998) agrees, particularly with sharing all professional responsibilities in class including planning, delivery, assessment and feedback. Moreover, providing encouragement, evaluation and feedback to improve validity of practice of co-teaching may result in success of the strategy (Nierengarten, 2013).

Compiling the work of Bacharach et al. (2008), Murawski (2002), Murawski and Dieker (2008), and Rehmeyer (2008) in order to summarise the fundamentals of a successful co-teaching relationship, Good et al. (2014) suggested that the first and foremost factor is the familiarity of the two partners professionally, intellectually, and if possible, emotionally. Honest and open communication in sharing constructive feedback, individual strengths and weaknesses, goals and responsibilities develops trust and respect for each other. Also planning, sharing and active engagement at all times would foster stronger interaction and relation and modelling positive professional behaviours because students learn by observing (Good et al., 2014).

Several studies that recommend strategies to maximize the effectiveness of a co-teaching interaction in higher education include engaging in open conversation around issues of power and responsibility, sharing, time management, mode of communication, professional and constructive feedback, teaching styles and behaviour management to develop trust, parity and non-judgemental attitude (Chanmugam & Geralch, 2013). Willingness to co-teach, purposeful pairing and administrative support are other key factors to avoid conflicts (Murphy & Beggs, 2010). Voluntary involvement creates a sense of ownership and willingness to invest in the collaboration (Nierengarten & Hughes, 2010; Reinheller, 1996).

Similarly, Nierengarten (2013) suggested twenty research-based practices that would support co-teaching teams in high schools. He had categorised them into three subsets; before-, during- and after co-teaching. These recommendations support the view that willingness to co-teach, administrative support, reflection and constructive feedback, planning, respect and a continued professional development support is needed to implement effective co-teaching. Stivers (2008) had previously suggested 20 different research supported strategies that could possibly be implemented to strengthen co-teaching relationships. These are categorised into planning and instruction, assessment, enhancing your partnership, extending reach and maintaining perspective. All the strategies suggested by various researchers have areas of overlap with emphasis on planning, communication and feedback, training and flexibility.

Research findings by Orlander et al. (2000) showed that a collegiate and collaborative relationship is the key to a successful co-teaching interaction. Communication needs to be open and honest to allow for discussion and constructive feedback. The participants need to show mutual respect despite power relationships or hierarchical status to build confidence and promote future learning. Furthermore, Kohler-Evans (2006) concluded

that collaboration and intensive planning stimulate and nurture better co-teaching relationships and that good relations build up trust (Connolly & James, 2006).

Several research articles support teacher training as a crucial component of successful co-teaching experiences. Administrators cannot expect teachers to co-teach effectively without pertinent knowledge of the philosophy and strategic skills of co-teaching (Friend et al., 2010). Teachers ready to teach bring their pedagogical and content knowledge to class but they still need training in effective communication to connect with their partners to work together and nurture the interaction (Friend, 2000; Gately & Gately, 2001).

Another necessary component for effective collaborative interaction is critical reflection which should be employed during planning, instruction and evaluation (Gately, 2005; Roth et al., 1999). Co-teachers should reflect on their practice, and any changes that could be incorporated to improve students' learning outcomes and better meet needs of students (Brownell, Adams, Sindelar, Waldron & Vanhover, 2006). Maintaining respect and personal dignity of both co-teachers and constructive feedback would foster strong collaboration (Murawski & Dieker, 2008). Co-teachers also need to critically self-reflect on their own temperament, weaknesses and strengths and develop open communication and collaboration with their peers (Ploessl, Rock, Schoenfeld & Blanks, 2010).

The epistemological and ontological beliefs and praxis of co-teachers needs to be analogous to foster a successful co-teaching relationship (Tobin, 2014). The association of co-responsibility, co-respect and co-generative dialogue with co-teaching is proposed for successful implementation of effective teacher training in institutes using co-teaching as a service delivery option (Scantlebury, Gallo-Fox & Wessell, 2008). Co-generative dialogue initiates discussion among students, cooperating teachers, trainee teachers, researchers to debate the issues encountered and find solutions (Scantlebury et al, 2008; Tobin, 2006). Villa et al. (2004) argued that any challenges encountered should be deliberated and resolved early. Murawski and Dieker (2004) suggested the use of a S.H.A.R.E. (Sharing Hopes, Attitudes, Responsibilities and Expectations) worksheet to create a dialogue at the onset with an aim to agree, compromise or agree to disagree. The co-teachers familiarise themselves with each other's educational philosophies and teaching competencies and interests. The conversation around the query of S.H.A.R.E. worksheet creates an academic and professional dialogue that can lead to a more collaborative interaction. The exchange of expectations during implementation of S.H.A.R.E. worksheets also prepares the participants/co-teachers to think and act proactively.

2.7 Summary

This chapter has discussed the philosophy underlying the concept of co-teaching with slight modifications reported in different contexts from inclusive education and teacher training, to more recent studies from higher education. Various co-teaching strategies have been reported emphasising some important components for successful and effective co-teaching experience. The central theme was to increase familiarity between co-teachers by open communication and constructive feedback, development of trust, parity and respect, and possession of effective interpersonal skills.

The benefits reported for teachers include intellectual stimulation by enriching content and pedagogical knowledge and sharing best practices of teaching. Novice co-teachers reported increased confidence, more risk taking and reflective teaching emulating best teaching practices. Students reported better teacher attention, interaction and support. The common challenges reported were lack of planning time, training, power imbalance and lack of interpersonal skills of colleagues. The challenges were not so extreme that they could not be addressed by purposeful pairing, training and open and honest communication.

Although educational institutions, especially higher education, are employing various innovative and appealing teaching strategies, it is imperative that the effectiveness of these strategies be evaluated to provide enough understanding and training to the educators for successful execution. This research study is unique because it aims to address gaps in the literature by researching co-teaching in higher education holistically from the perspective of teachers and students and to explore factors for its successful implementation.

The following chapter describes in detail the planning of the research process for this study, and its execution with the specifics of rationale, the case, instruments to collect data, and data analysis procedures.

Chapter 3

Research Methodology

3.1 Introduction

Chapter 2 reported a review of the literature providing a conceptual and theoretical perspective of co-teaching elucidating its development and evolution and further application in various educational contexts. An overview of different perceptions and experiences of students and educators (co-teachers) was also presented. The literature guided and defined the current research study and a case study research design was selected with a multi-paradigmatic approach through a post-positivist and interpretive paradigm lens. These two research paradigms further guided the choice of the research design and helped to frame the research questions. The current chapter provides a detailed explanation of the research design and its execution. This research study is unique as it addresses an identified gap in the literature for any published study where a holistic view of co-teaching in a higher education context was explored. This research incorporates students' and co-teachers' perspectives and experiences of co-teaching providing their insight into further enhancement of the co-teaching strategy leading to better teaching and learning experiences of students and co-teachers.

The chapter is organised in a sequential way as described. Firstly, in Section 3.2, an argument is presented for the choice of paradigm to shape the research design which is presented in Section 3.3. An overview of the research questions is addressed in Section 3.4. Section 3.5 introduces the participant sample and the context of the study. Ethical procedures that were followed to carry out this study and the description of various data collection procedures are discussed respectively in Sections 3.6 and 3.7, followed by data analysis procedures in Section 3.8. Finally, data validity and reliability procedures are explained in Section 3.9 culminating in the summary of the chapter in Section 3.10.

Educational research is a methodical and empirical process of discerning specific aspects of an educational enquiry based on the relevant data collected. Tuckman and Harper (2012) proposed that educational research can be carried out by selecting a problem,

sorting out the range of relevant variables through a literature search, designing a research strategy to investigate that problem, collecting and analysing appropriate data and then drawing conclusions about the relationship among the variables. As reported by Cohen, Manion and Morrison (2011), “ontological assumptions” lead to “epistemological assumption” deciding “methodological considerations” that initiate “instrumentation and data collection” (p.3). So in order to conduct any educational research investigation, the researcher needs to justify employing a particular research design by considering its applicability in that situation.

3.2 Research Design

3.2.1 Rationale

The overarching aim of this research study was to develop an evidence-based understanding of co-teaching and its suitability in a tertiary educational setting. To achieve a holistic view of co-teaching by understanding the perceptions and teaching and learning experiences of participants (students and co-teachers) in a co-taught learning environment implemented in this higher education classroom, a case study research methodology was adopted. Case study design was chosen to better understand ‘why’ co-teachers interact differently with their peers in different sessions, and to gather more insight into ‘how’ they implement co-teaching in their respective sessions revealing their conceptual understanding of the philosophy of co-teaching. Also of interest are their interaction with the students and choice of different strategies of co-teaching in their co-taught classrooms. As reported by Yin (2009), a case study enables a better understanding of the ‘how’ and ‘why’ of a research context. Case study, furthermore, provides an in-depth understanding of the research unit by collecting several different forms of data (Creswell, 2012). The emphasis is also on exploring the understanding of the philosophy of co-teaching from students’ and co-teachers’ perspectives. On the one hand this research highlights the benefits and challenges of co-teaching whereas on the other hand, it provides an insight into students’ perspectives of ‘how’, ‘why’ and ‘if’ they perceive a co-teaching model effective for student learning experiences.

To employ a case study as research methodology, I also deliberated about the ‘practical and substantive considerations’ (Yin, 2009). The situation that made the case study unique and appropriate included the substantive consideration that co-teaching was a newly

introduced pedagogy in the Faculty of Health Sciences, and practical in the degree of ease of access and availability of data sources.

3.2.2 Research Methodology

A rigorous research outcome is achieved when the research design is aligned well with the research methods with an overall presentation of a rational and intelligible data (Creswell, 2012). This study is described as a large scale, descriptive case study supported by triangulation of data. The case study methodology was preferred after thorough consideration of other relevant strategies. This was neither a study involving cultural groups in natural settings (ethnography), nor development of a theory (grounded theory), nor narration of an individual's life (narrative) (Cresswell, 2012). The sole emphasis of this study was to gain an overall perspective of an understanding and suitability of co-teaching pedagogy in the context of an interprofessional core unit in Health Sciences at Curtin University. Hence, a case study methodology was preferred for this research study drawing from the epistemologies from two major paradigms of post-positivism and interpretivism. Assuming that there are multiple realities of the world view and participants create their own opinions (Guba & Lincoln, 1994), this study drew on constructivism as its ontology.

A case study as described by Cohen et al. (2011) is “a unique example of real people in real situations, enabling readers to understand ideas more clearly than simply by presenting them with abstract theories or principles” (p. 289). Yin (2009) argued that there are three specific criteria to study in a case study namely ‘what’, ‘how’ and ‘why’ to get an understanding about any case. Stake (2000) argued that a case study is conducted in a situation that is unique, is specific, has boundaries of space and time and also has a context. Inferences from case studies can have impact on stake holders, policy makers and on further research potential (Merriam, 2009). In summarising the work of various researchers, Cohen et al. (2011) pointed out that the strengths of a case study are in its setting in real life contexts with thick and opulent description of lived experiences and thoughts of participants and systematic and rigorous data collection. The data thus presents an insight into the detailed reality of complex human interactions and the sense-making process in a unique setting of a phenomenon.

The problem that I wanted to investigate fitted very well with the description of a case study (Yin, 2009). The phenomenon in this study could be described as the co-teaching pedagogy, whereas, the unit of analysis was to understand the perceptions and

experiences of the participants, the students and co-teachers. The context was a particular human biology first year university core unit (HUMB1000) that was bound by time and space of a semester of a specific higher educational institution. The data were collected in real time in the natural setting. I also wanted to address the questions that would answer ‘what’, ‘how’ and ‘why’ of co-teaching pedagogy (explained in Section 3.4). The extended aim of the study was to make an evidence-based recommendation regarding the effectiveness and relevance of this specific pedagogical strategy for this unit and recommend suggestions for further improvement if deemed relevant. The results could then be extrapolated to see the relevance of co-teaching in other units across the university.

While designing a case study, care had to be taken to avoid my bias as a researcher. I was integrally involved in this case, having taught in this unit for many years. Also, as a researcher, I needed to be well acquainted with the case for the reason that the findings are subjective and not generalisable in most of the cases (Nisbet & Watt, 1984).

To gain an in-depth understanding of the case, data should be rich and collected using various methods systematically and carefully (Cohen et al., 2011). Yin (2009) suggests having a combination of qualitative and quantitative data collection methods using nominal and ordinal data with an intention to triangulate to address the research questions. Hence a mixed method of data collection was used, and this is further explained in Section 3.7. An overview of the research design is presented in Figure 3.1 overleaf.

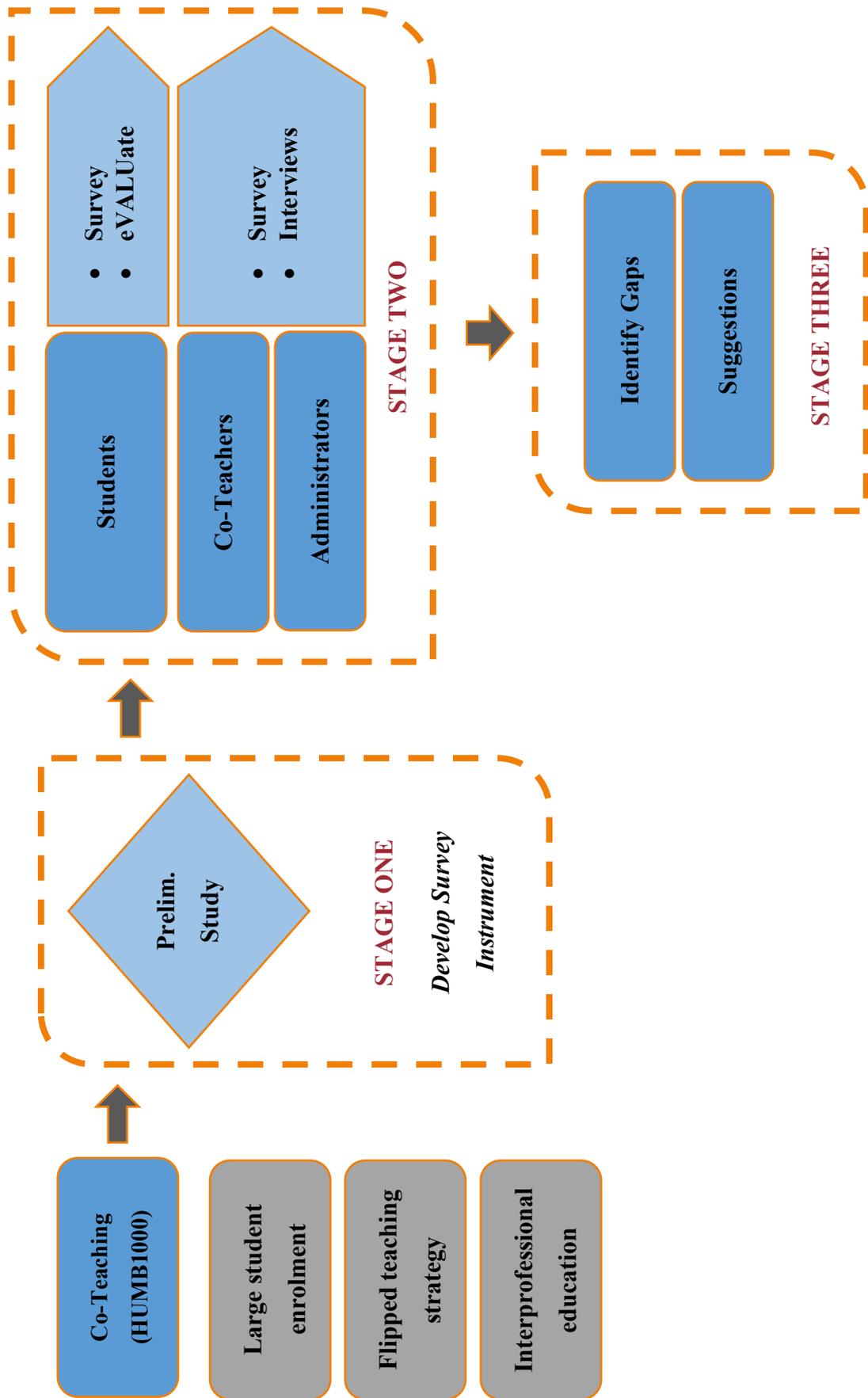


Figure 3.1 An illustration of the research design

3.3 Research Paradigm

To substantiate the methodology for a research study, paradigm is a key factor. Taylor, Taylor and Luitel (2012) suggest that paradigm means “a specific framework for conceptualising, investigating and communicating about the world” (p. 374). Paradigms help to guide and direct the research enquiry process from conception to completion (Treagust, Won & Duit, 2014). There is a large volume of literature that compares and substantiates various paradigms used in educational research (Guba & Lincoln, 1994; Mackenzie & Knipe, 2006; Taylor, Taylor & Luitel, 2012; Treagust, Won & Duit, 2014). Drawing on the literature of educational research, a multi- paradigm research strategy was employed to gain an understanding of the co-teaching pedagogy adopted in one unit in a higher education context. Post-positivism and interpretivism were deemed as relevant theoretical frameworks for this research. This research study has two phases, firstly to develop and validate an instrument to gauge the perceptions and experiences of participants in a preliminary study; and secondly, to investigate and interpret these perceptions and experiences in a co-taught learning environment for the main study.

Development of an instrument is a systematic and pragmatic process that calls for a rational conduct. A post-positivist approach was applied to develop and validate the instrument. Post-positivism purports evidence-based, objective, unbiased and generalizable truth of an educational phenomenon where the researcher has no personal connection with the participants (Treagust, Won & Duit, 2014). This paradigm usually supports methodical development of a quantitative instrument to record participants’ perceptions and experiences (Jaeger, 1997). As Taylor and Medina (2011) state, post-positivism “produces objective and generalizable knowledge seeking relationship in pre-defined variables” (p. 4). Post-positivism recognises that knowledge is relative rather than absolute but it is possible to distinguish between more and less credible claims using empirical evidence (Patton, 2002). So a post-positivist paradigm can help me to uncover facts about co-teaching from the lived experiences of students and co-teachers.

Human perceptions and experiences are idiosyncratic and may be influenced by their social, cultural, contextual and personal experiences (Treagust, Won & Duit, 2014). Merriam (2009) has proposed that a single event could have multiple realities, thus an interpretive paradigm will guide me to engender context-based understanding of a participant’s thought process, belief and values. An interpretive paradigm supports a subjective approach where the researcher studies the phenomenon through the

experiences of people in their lived situations. An interpretive process is the relevant way to explore lived experiences of the participant. I, being a part of the teaching team in the unit, have developed rapport with the colleagues and so had a sense of the context.

The interpretive paradigm can help me to comprehend and understand others' perspectives and establish connections with their experiences (Merriam, 2009; Willis, 2007). The assorted interpretations with different perspectives of co-teaching experiences and expectations can add opulent descriptions to the research context.

Creswell and Clark (2011) recommend that mixed-methods research provides philosophical assumptions and methods of inquiry that inform the collection and analysis of data in a research study. Hence, incorporating qualitative and quantitative methods of data collection and analysis and then triangulating the results strengthened the research inquiry. An overview of various aspects and approaches undertaken in this research study to investigate co-teaching are shown in Table 3.1 overleaf.

Table 3.1

An overview of the research process followed in this research study

Aspects of the research process	Approach taken in this study
Research methodology	Case study
Research paradigm	Multiparadigm <ul style="list-style-type: none"> • Post positivism • Interpretivism
Methods of data collection	Mixed method <ul style="list-style-type: none"> • Surveys • Interviews • eVALUate feedback comments
Data interpretation	Quantitative analysis <ul style="list-style-type: none"> • SPSS statistical software Qualitative analysis <ul style="list-style-type: none"> • Manual coding • NVivo Pro (v11) software package
Validity and reliability	Triangulation Participant checking Peer debriefing Member checking
Ethical issues	Informed consent Confidentiality & Anonymity

3.4 Research Questions

This study aimed at investigating the perceptions and experiences of students and co-teachers in a tertiary learning environment. To achieve this aim, the following research questions were established:

1. Can a valid and reliable tool be developed to evaluate co-teaching perceptions of students and co-teachers in higher education?
2. What are the perceptions and learning experiences of first year students regarding co-teaching as a pedagogical strategy in HUMB1000?
3. What are the perceptions of co-teachers regarding co-teaching as a teaching strategy in HUMB1000?
4. What are co-teachers' conceptual understanding of co-teaching as a teaching strategy?
5. Is there any association between perceptions of co-teaching and demographic variables such as age, gender, nationality and educational qualification?
6. How has co-teaching experience impacted co-teachers' own teaching praxis?
7. What strategies could be implemented to ensure effective co-teaching and positive learning experiences for students and co-teachers?
8. What are the teaching experiences of co-teachers using co-teaching as a pedagogical approach with regard to (a) benefits and (b) challenges?
9. How has this research on co-teaching in Health Sciences experience influenced my view of teaching and learning?

The analysis and discussion of these research questions are addressed in Chapters 4, 5, 6, 7 and 9.

3.5 Research Participants

The participants involved in this research study were the students and co-teachers involved in HUMB1000 at Curtin University, at its Bentley Campus in Western Australia. The data source was chosen for the convenience of access because I teach this unit, and for practicality, as HUMB1000 employs co-teaching pedagogy. The sampling was purposeful and the participants had to be either a student enrolled in, or a co-teacher teaching the unit HUMB1000 and were willing to participate in the study. Sets of data

were collected from students enrolled in Semester 1, 2015 and the co- teachers co-teaching the unit that semester.

3.5.1 The Case

The unit of analysis is an introductory human anatomy and physiology unit titled Human Structure and Function (HUMB1000) that was implemented in 2011 (formerly titled HSF100). It is a first year interprofessional core unit taught across 23 courses (programs) in the Faculty of Health Sciences. Since this unit is a core unit, it has large student enrolments. The HUMB1000 unit runs for a complete semester, comprising 12 teaching weeks each semester, and in both semesters of the year but with different student cohorts. In Semester 1, 2015, the total student enrolment was 1,491 increasing in Semester 1, 2016 to 1,955. Semester 1 was chosen for the data collection because of the higher student enrolment than in the second semester. Currently (Semester 1, 2019), the unit has a total of 2,042 students enrolled.

To accommodate learning needs of such a large group, a flipped classroom strategy is employed. All the lectures are delivered on-line as i-lectures, accessed prior to a two-hour face-to-face interactive workshop session every week for laboratory work and other topics related activities. Every week a new chapter topic is discussed. In Semester 1, 2015 there were 43 such interactive sessions organised per week to accommodate all the students. Each session is co-taught and facilitated by two teachers. In these sessions, the co-teachers carry out a variety of practical and theory- based activities grounded on the i-lecture content. To maintain consistency in content delivery, learning resources are already prepared and provided to all the co-teachers on unit Learning Management System (LMS). The unique characteristic of this case is that despite all the teaching content and activities being predesigned and delivered to all teaching staff, co-teachers could use their teaching skills and abilities to deliver the content to students in what they consider to be the most effective and interactive ways.

3.5.2 The Students

The main data were collected from students enrolled in HUMB1000 unit in first semester of their first year of the bachelor's degree. The cohort of student participants came from a wide range of backgrounds and all were enrolled in any one of the several Health Sciences courses. Although the majority of students were school leavers, there was a

small proportion of mature age students and some international students. There was a relatively higher number of female students than male students.

3.5.3 The Co-Teachers

The co-teachers teaching in HUMB1000 unit are engaged from various other schools in the Faculty of Health Sciences to form a team of interprofessional co-teachers. These co-teachers have diverse professional backgrounds and include doctors, nurses, physiotherapists, pharmacists, medical scientists, science teachers and educators. Their experiences also ranged from being novice teachers and co-teachers to highly experienced teachers and co-teachers. The co-teachers also achieved varied degrees of academic qualifications, some with a Doctorate, some currently working through their doctoral studies and others with a Master degree. Such an interprofessional team helps to foster integration of varied professional and disciplinary information and encourages better learning by incorporating various teaching methodologies and ideas. Each pair of co-teachers teaches a session together for the whole semester. A co-teacher can co-teach more than one session, so there is a probability of one co-teacher teaching multiple sessions with different co-teachers forming collegial bonds.

Most of the co-teachers teaching in this unit are employed as casual academics while a few are in continuing academic roles. In Semester 1, 2015, 28 co-teachers were engaged to teach this unit, twenty being casual co-teachers and eight continuing academics. This was similar in Semester 1, 2016 wherein out of the 35 co-teachers employed, 25 were casual and ten were continuing staff. Currently (Semester 1, 2019), there are 37 co-teachers employed, 28 are casual and nine are staff with continuing employment. The cohort of co-teachers is dominated by females, with eighteen out of 28 in Semester 1, 2015 and 25 out of 35 in Semester 1, 2016. The allocation of sessions and co-tutors is mainly random but certain factors are taken into consideration like availability of casual co-teachers, incompatibility of some co-teachers due to previous experiences or preference to co-teach with a particular co-teacher. However, attention is given to pair a novice co-teacher with an experienced one and, if possible, not to pair co-teachers from the same professional field together. It is an immense challenge to organise and timetable an interprofessional teaching team involving many variables especially specific requests from various schools to cater to the available timings of the continuing staff.

3.6 Ethical Procedures

Appropriate attention was paid to follow proper ethical procedures before starting this research study.

3.6.1 Institutional Permissions

The research proposal with details of the aims of research study, methods and draft plan of data collection and significance was submitted to the Graduate Studies Committee and Human Research Ethics Committee for approval. Permission was then sought from the unit coordinator to run the research study in HUMB1000 (then known as HSF100). The survey proposal also needed to be sanctioned by Curtin Survey Approvals from the Office of Strategy and Planning. According to Curtin University policy, if students or staff at Curtin University are used as data sources, then permission must be sought from Curtin Survey Approvals to minimise survey fatigue among the respondents and ensure unbiased interaction with surveyed population. After receiving formal permission from all the relevant committees and authorities, the schedule for administration of survey and interviews was worked out.

3.6.2 Participation Information Sheet

A separate participation information sheet was scripted and issued to the unit coordinator, co-teachers and students explaining the aim and scope of the study. The information sheet highlighted roles and responsibilities of each of the participants and the researcher. A clear mention was made about their participation being voluntary, confidential and anonymous. The participation information sheet is included as the appendices (see Appendices A, B and C).

3.6.3 Consent Form

The participants were also issued with the consent form. The co-teachers signed the consent form before embarking on the study. Due to the large number of students it was not possible to get signed consent from all. Considering them as adults (some were minor adults), it was mentioned in the consent form provided that consent was taken as positive if they filled and submitted the survey. The consent form is included as the appendices (see Appendices D and E).

Students were also emailed the information about the research study by the unit coordinator and were referred to the Learning Management System (LMS) at the

University, Blackboard, for further information. Both participation information sheet and consent form were also available on Blackboard for further perusal. After receiving formal permission from all the stakeholders (authorities and participants) involved, the process of data collection commenced. Data collection was planned to have minimal disruption to the HUMB1000 classroom sessions.

3.7 Data Collection

This research study used a mixed method approach of data collection to collect data in number (quantitative) and text form (qualitative). A mixed method approach not only incorporates collection of quantitative and qualitative data but also analysis and integration of the two to integrate statistical and personal experiences producing comprehensive interpretations which none of them could produce independently (Creswell, 2014). The quantitative data were collected in the form of surveys administered to both students and co-teachers. The qualitative data collected from students included open-ended questions incorporated in the survey and evaluative comments collected from university-wide feedback system, eVALUate. The qualitative data collected from co-teachers included open-ended questions incorporated in the survey and semi-structured interviews.

The research study was designed to be carried out in two phases that would run parallel to each other. The first phase involved administering the survey to students and co- teachers. The second phase involved interviewing the co-teachers and collecting evaluative comments of students at the end of the semester. This mixed methods research design of data collection and analysis fits in the convergent parallel design (Creswell, 2012) wherein both qualitative and quantitative data are collected simultaneously during the study. Both data sets are analysed separately and results compared to deduce if the results support or contradict each other helping to better understand the research problem. A further aim is to triangulate the data and review the perceptions and experiences of students and co-teachers for any commonalities in the opinions of students and co-teachers.

3.7.1 Quantitative Data

Quantitative data is the information that can be measured and collected in numerical form and analysed statistically, ranked and put into categories. In educational research, quantitative data are often collected from survey instruments using a Likert scale. The

review of literature on co-teaching in higher education did not reveal any standardised questionnaire that would evaluate perceptions and experiences of co-teaching.

However, various researchers have designed their own questions to answer their specific research aims. These questionnaires have not been validated. So there was a need to develop and validate such a survey instrument. Chapter 4 describes the process of development and validation of a survey instrument (Co-teaching Perception and Experience Survey, or CPES) that was used to collect data from students and co-teachers. The student version was validated and then the language was contextualised to fit the co-teacher context. The underlying aim to use similar versions of the survey instrument was to compare the students' version with the co-teachers' version and consequently find overlaps and gaps in their perceptions.

3.7.1.1 Survey

After developing and validating the CPES, the survey was to be administered to the students. Data collection from students created some challenges. Initially, an online version of the survey questionnaire was developed and students were instructed through an email to complete it online. At the end of response period, despite repeated reminders only 236 students had responded (response rate of 15.8%). After consultation with the supervisors, for a better student response a paper-based survey was administered to students in week 11 of Semester 1, 2015.

The choice of the timing was intentional and crucial. Firstly, by week 11, students would have been well exposed to co-teaching as a teaching strategy. Secondly, this was an assessment week, meaning that students were more likely to attend and thus I would be able to involve more participants. The survey was a paper-based questionnaire and 30 minutes were allocated to complete the survey after the students had completed and submitted the assessment. Before distributing the survey, students were made aware of the research purpose and informed about the voluntary, anonymity and confidentiality criteria for participation in the research survey. Completing the survey was considered as consent to participate in the research. They were also directed to Blackboard (Curtin's Learning Management System) for any further information about the project. This data thus collected was used for this exploratory study.

The paper-based CPES, along with the participation information sheet and the consent form, was also provided to the co-teachers. The co-teachers submitted the completed survey at a collection point to maintain anonymity which was then handed to me for

further processing. To maintain confidentiality of participants (students and co- teachers) no identifying information such as student/staff number or name was requested.

3.7.2 Qualitative Data

Qualitative data is non-numeric data that can be observed, experienced and sensed but not measured statistically or numerically. To gain an accurate and detailed description of the co-teaching perceptions, interactions and implementation in the classes, observation in naturalistic settings was crucial. Authors like Wallen and Fraenkel (2001) and Johnson and Christensen (2008) suggest that observing participants in real world settings provides a tangible view of behavioural patterns.

It is important to capture the inner feelings, ideas and thoughts of participants if a particular phenomenon is to be understood from the participant's perspective. Participant interviews provide an opportunity to delve deeply into the understanding, perceptions and experiences of the participants (Mears, 2012) and make meaningful inferences. Bryman (2008) believes that interviews are an efficient data collection tools to collect rich and detailed data while Creswell (2012) adds that the participants who are to be interviewed should be expressive, intrepid and willing to share true feelings. Open-ended interviews are useful because specific probing questions can be asked to elicit information (Creswell, 2012).

Citing Silvermann (1993), Oppenheim (1992) and Morrison (1993), Cohen et al. (2002) suggested that to maintain reliability and validity of interviews, care should be taken by the interviewee to reduce bias by a) drafting a structure for interview; b) maintaining consistency of language; c) avoiding 'leading questions' that support preconceived perceptions; d) using clear language for the questions; e) exhibiting professional behaviour; and f) establishing trust and avoiding any power play. I was aware of these factors from being a part of the teaching team. I knew the other co- teachers and had their trust, but no power relationship with them. I conducted semi- structured interviews that were "...sufficiently open ended to enable the contents to be reworded, digressions and expansions made, new avenues to be included, and further probing be undertaken" (Cohen et al., 2011, p. 236).

Observation in naturally occurring social settings is a flexible and authentic data collection tool due to its nature of collection (Cohen, Manion & Morrison, 2011). 'In situ' data offers a reality check for actual behaviours of people (Robson, 2002) and provision to scrutinise some behaviours that are less dominant (Cooper & Schindler,

2001). Class observation of co-teachers to explore co-teaching behaviours in class would have given me an insight into actual and observable behaviours authenticating the interview data. Due to time constraints and logistical challenges such data was not deliberated.

3.7.2.1 Interviews

An email was sent to the co-teachers teaching HUMB1000 inviting them to participate in the interview. Complete information about the research project in the form of 'participation information sheet' and 'consent form' was attached for further perusal. Seventeen co-teachers volunteered for a one-on-one interview. A mutually convenient time was organised and interviews were conducted with each of fifteen co-teachers that lasted for approximately one hour. The process of the interview was explained to each participant before starting the interview recording. A room was booked so participants could be interviewed in a private and peaceful environment where they could feel comfortable and safe. The responses were recorded on an audio-recorder and later transcribed. Two co-teachers could not organise time for a face-to-face or telephone interview but agreed to write their responses on the questionnaire for the interviews.

A copy of the interview questions was emailed to participants prior to the interview to provide them with the opportunity to familiarise themselves with the questions and provide sufficient time to reflect on their current and previous experiences of co-teaching.

In-depth semi-structured interviews were conducted to explore detailed information about co-teachers' perceptions and experiences that could not be captured by the survey (Denzin & Lincoln, 2005). Being familiar with me enhanced comfortable and more personalised interaction of the interviewees. The added advantage of familiarity allowed me to access uninhibited expression of various experiences that might not have been possible with a facilitator or an unknown interviewer. Conducting an interview with premeditated questions also allowed a degree of consistency across the conversation and flexibility to further elaborate when required.

3.7.2.2 eVALUate Comments

Curtin University systematically receives feedback from students about their perception of learning experiences through an online survey system, eVALUate, available to all undergraduate and postgraduate students. The survey collects student responses to the factors that stimulate or impede their motivation, engagement and overall satisfaction in each unit (Curtin website). Students can also comment on their perception of the efficacy

of individual teaching staff. These comments are then used by the University to further improve the content and delivery of the units. It is a standardised tool that is used at the end of each study period and students are prompted via official emails to respond to eVALUate survey.

eVALUate is a source of qualitative comments from students that could not only be used for assessing curriculum and content but also reflecting on pedagogy and teacher efficacy. Teachers can request student responses for their own teaching. The student feedback regarding the unit is confidential and only the unit coordinator has access to it. Due to poor response rates for student interviews, the eVALUate survey was used as a data tool to collect student comments regarding co-teaching. The access to the qualitative comments provided by students for the unit is restricted to the teaching staff and the unit coordinators. Co-teachers can access only their own teaching feedback comments.

To gain a holistic view of students' view of co-teaching, permission was sought to access the feedback comments. These comments would provide a meaningful insight into student's perceptions of co-teaching in the unit. The various data collecting tools proposed to address the intended research questions are presented in Table 3.2.

Table 3.2

Relationship between research questions and data collection tools

No.	Research Questions	Data Source
1	Can a valid and reliable tool be developed to evaluate co-teaching perceptions of students and co-teachers in higher education?	<ul style="list-style-type: none"> • CPES survey (S* & CT*)
2	What are the perceptions and learning experiences of students regarding co-teaching as a pedagogical strategy in this unit?	<ul style="list-style-type: none"> • CPES survey (S*) • eVALUate data
3	<p>What are the perceptions of co-teachers regarding co-teaching as a teaching strategy?</p> <p>a) What are co-teachers' conceptual understanding of co-teaching as a teaching strategy?</p> <p>b) Is there any association between perceptions of co-teaching and demographic variables such as age, gender, nationality and educational qualification?</p> <p>c) How has co-teaching experience impacted co-teachers' own teaching praxis?</p>	<ul style="list-style-type: none"> • CPES survey (CT*) • Interviews
4	What strategies could be implemented to ensure effective co-teaching and positive learning experiences for students and co-teachers?	<ul style="list-style-type: none"> • CPES survey (S* & CT*) • Interviews • eVALUate survey
5	What are the teaching experiences of co-teachers using co-teaching as a pedagogical approach with regard to (a) benefits and (b) challenges?	<ul style="list-style-type: none"> • CPES survey (CT*) • Interviews
6	How has this research on co-teaching in Health Sciences experience influenced my view of teaching and learning?	<ul style="list-style-type: none"> • Reflective writing

*S – Student version; *CT – Teacher version

3.7.2.3 Open-Ended Questions of Survey

Another way to collect students' and co-teachers' perception and experiences of co-teaching was through the three open ended questions included in the survey. The questions were aimed at asking specifically how they perceived co-teaching pedagogy. I focussed on including experience questions (Patton, 2002) that would help to further explore students' and co-teachers' perception and experiences of co-teaching.

The three questions were:

- a) What do you like about co-teaching?
- b) What do you not like about co-teaching?
- c) How can co-teaching be improved in coming years?

3.8 Data Analysis Procedures

Data analysis involves scrutinising the collected raw data and seeking meaning in a systematic way. Quantitative and qualitative data were analysed differently using appropriate analysis tools. The following is the explanation of the procedures to analyse both quantitative and qualitative data. The main aim was to look for any relationships between various variables, and the development of various themes and patterns to answer the research questions.

3.8.1 Quantitative Data

After collecting the student's and co-teacher's surveys, they were stored separately in labelled boxes. The surveys were visually scanned to eliminate any incomplete surveys. Some participants had completed one or two pages and left the rest blank. Such incomplete surveys were excluded from the raw data. All the surveys were systematically entered into separately labelled excel worksheets. From the Semester 1,

2015 cohort, 1,135 student surveys were entered into a Microsoft Excel spreadsheet. In the same way, 26 co-teacher surveys were also processed. Missed or blank responses for any question were left empty. Coding was used for the demographic questions of the CPES instrument. The co-teaching responses were coded on a 5-point Likert scale with 1 as 'strongly disagree' and 5 as 'strongly agree'. The accuracy of data entry and coding in the Excel sheet was checked using a random sample of 20 students and 5 co-teacher surveys.

The data were then imported into IBM SPSS (v25) statistical package for further analysis and analysed for descriptive and inferential statistics. The detailed factor analysis, discriminant validity and Cronbach alpha reliability of the CPES instrument is explained in Chapter 4 (Section 4.6). The descriptive statistical analysis of student data and teacher data is also explained in Chapter 4 (Section 4.6.2). The data were further analysed to investigate the perceptions of students and co-teachers regarding co-teaching along five

scales of Teacher Support, Student Satisfaction, Teacher Collaboration, Student/Teacher Equity and Teacher Innovation.

3.8.2 Qualitative Data

Cohen et al. (2011) describe qualitative data analysis as “making sense of data in terms of participants’ definitions of the situation, noting patterns, themes, categories and regularities” (p. 184). There is not a single correct way of analysis to reach that conclusion; rather, it depends on the interpretation of the researcher. Care should be taken to ensure that it suits the researchers’ purpose.

The qualitative data inclusion in this mixed method research process was dualistic. Primarily it served the purpose of providing me with an in-depth understanding of co-teachers’ and students’ perspectives and experiences about co-taught pedagogy and secondly, aided an overall view by triangulating the qualitative data with the quantitative data. The qualitative data were collected using co-teacher interviews, open ended questions in students’ and co-teachers’ surveys and students’ comments in eVALUate feedback. All the qualitative comments were read several times to generate an understanding of their meaning before carrying out a detailed analysis manually or using NVivo Pro (v11) software. Manual coding of the data was used to categorise and analyse students’ eVALUate comments due to small numbers and limited textual responses. Manual coding of the data and analysis was initially used for co-teachers’ CPES qualitative comments (see Appendix I) due to a smaller number of participants (n=26), but final analysis was conducted using NVivo Pro (v11) software. NVivo Pro (v11) software is used to organise, analyse, explore patterns, identify themes and develop meaningful conclusions from a qualitative data (NVivo, 2017). Due to a large student data set (n=1,111) and a large number of co- teachers’ interview comments, NVivo Pro (v11) was used as an analysis tool. The analysis of each data set is described in the following sections.

3.8.2.1 Interviews

As mentioned in Section 3.7.2, the audio recorded interviews of the co-teachers were transcribed by me on a Microsoft Word document. Although a time-consuming process, the transcription of the interviews gave me an opportunity to engage with the data and mentally process it to estimate a preliminary indication of the themes. Care was taken to transcribe the interviews verbatim but speech dysfluencies (fillers such as ‘umm’, ‘huh’ and ‘err’), poor grammar, and false starts were not mentioned in the text. This was a

deliberate act to avoid any anxiety or concern that participants may have which might result in their withdrawal from the interview or avoidance of any future ones (McCoyd & Kerson, 2006) as the transcribed interviews were to be sent for confirmation of text to the participants. All the files were then saved using pseudonyms like CTI 1, 2, 3 and so on till number 17. The transcripts from the interviews were then sent to each participant for participant checking.

The transcript files were then uploaded into qualitative research data analysis software NVivo Pro (v11) as document files to facilitate analysis. The transcripts were read and reviewed several times to absorb the discussion and conversation. The preliminary exploratory analysis (Creswell, 2012) of raw data collected allowed me to search for meaning and make sense of the data based on the aims and objectives of the research topic. After scanning through the data, grounded theory was chosen as an appropriate procedure to analyse the qualitative data. Grounded theory is an analytical process that allows the observed data to speak for itself and allows the emergence of codes and themes. Informed by *a priori* codes (deductive and predetermined) from the literature, an open or generative coding (inductive and emerging from data) procedure was employed to develop preliminary codes for the data set. This procedure helped to develop initial codes within the data. The details of various codes thus generated are reported in Chapter 6 (see Section 6.2.3). Once preliminary coding was done, through various reiterations using analytical and critical thinking skills, then similarly meaning codes were amalgamated to form 'nodes'. Data were then merged into themes based on selected nodes which were systematically organised to facilitate answers for research questions (Ozkan, 2004).

The data were then analysed keeping in mind manifest content analysis and latent content analysis (Dunn, 2010). The frequency of use of a particular word or phrase to express a view is assessed superficially by manifest content analysis, whereas, latent content analysis looks for underlying meanings of the text in search of themes. Analysis of data allowed me to assess the multiplicity of opinions expressed by participants for various questions asked

3.8.2.2 eVALUate Comments

The eVALUate comments for the unit are confidential and only the unit coordinator has access to the data. Upon receiving ethical approval to collect and use the comments for this research project, the unit coordinator printed the qualitative comments and redacted the names of any co-teachers mentioned in the survey to maintain confidentiality of the

co-teachers. Using a highlighter, all the comments related to co-teaching were marked. All the comments were then segregated into three categories: i) what they liked; ii) what they did not like; and iii) how co-teaching could be improved. The comments were then copied onto three separate Microsoft Word documents for analysis. The data were then analysed manually looking for themes (Cohen et al., 2011) using grounded theory. A detailed data analysis procedure is described in Chapter 5 (Section 5.3).

3.8.2.3 Open-ended Questions of Survey

The responses of the three open-ended questions of the CPES instrument for students and co-teachers were systematically compiled separately in Microsoft Word documents. The co-teacher data were analysed manually due to smaller sample size (n=26). The student data were analysed using NVivo Pro (v11). Both data sets were analysed for nomothetic properties (Cohen et al., 2011) looking for both *a priori* and emergent themes, commonalities, patterns and similarities of opinions. The details of data analysis are reported in Chapter 5 (Section 5.2.3) and Chapter 6 (Section 6.2.3).

3.9 Data Reliability and Validity

A case study requires the researcher to collect in-depth data using various methods and methodologies, and to effectively analyse the diverse data with clarity of focus and direction that is context specific (Cohen et al., 2011). Evidence must be provided to support the authenticity of the data collection and analysis in absence of an external check. Case studies have been criticized for lack of rigour (Yin, 2009). Quoting analysis of research output of Russell, Gregory, Ploeg, DiCenso and Guyatt (2005), Baxter and Jack (2008) suggested that novice researchers should plan a case study meticulously and ethically with purposeful sampling, systematic collection and analysis of data to enhance trustworthiness of their case study.

A research study is undertaken to produce a plausible and credible explanation of a phenomenon following a rigorous approach (Yin, 2009). Great emphasis was made to maintain authenticity and quality standards of the research process, although, different terminology is used for quantitative and qualitative research processes. Guba and Lincoln (1981) stated that rigour for quantitative research could be evaluated on the basis of internal validity, external validity, reliability and objectivity. However, in 1985, Lincoln and Guba presented a reformed version of criteria to assess rigour of a qualitative research by citing the 1981 terms now as credibility, transferability, dependability and

confirmability criteria. They also suggested specific verification strategies to achieve such claims.

This case study is embedded in a multi-paradigm setting and mixed method design, so the quality standards for qualitative and quantitative methods of data collection and analysis need to be well justified. Merriam (2009) suggests that research needs to be conducted in an ethical manner to produce valid and reliable knowledge. So legitimation, validity and reliability are the main quality standards that need to be justified. Guba and Lincoln (1994) suggest that trustworthiness used as quality standard in interpretive paradigm is comparable to external and internal validity of post-positivist paradigm. To enhance authenticity and trustworthiness of the data following criteria were addressed.

3.9.1 Credibility

I have been teaching HUMB1000 at Curtin University since 2011. Through general social interaction during meetings and co-teaching, I have developed collegial relationships with the co-teachers. This interaction has helped me develop trust and rapport with the co-teachers and hence enthusiasm to provide honest answers during interviews. Such prolonged engagement with the participants increases the credibility of the data (Guba & Lincoln, 1994) and ensures it is collected without any bias. The student responses were anonymous (survey) and also online (eVALUate), so there was no obligation on students to produce socially acceptable responses.

3.9.2 Triangulation

To ensure extensiveness and confirmability of data, various methods were used to study the phenomenon (Creswell, 2012) that combine the strengths and offset the weaknesses of either method. Triangulation provides a holistic understanding of the phenomenon under observation. Triangulation of individuals (co-teachers and students), data sources (interviews, observation, surveys) and methods of data collection (qualitative and quantitative) was considered for idea convergence and confirmation providing an accurate and credible view of the co-teaching phenomenon (Creswell, 2012). To overcome any bias of result reporting, interview extracts and comments were provided when reporting research results and themes.

3.9.3 Peer Examination

Guba and Lincoln (1994) advocated that peer debriefing by an expert in the field could support credibility of findings. After coding the qualitative data, opinions were sought from the supervisor and another academic expert teaching and researching in the co-teaching field. The aim was to verify if the coding process and the themes were accurately labelled. This enhanced the credibility, dependability and authenticity of the coding process and themes thus generated.

3.9.4 Member Checking

One way of confirming the authenticity of participants' views expressed in interview is member checking by providing the participants with their transcribed narrative to verify for accuracy (Merriam, 2009). The interview transcripts were emailed to individual participants to check and acknowledge that the information was recorded accurately thus improving the credibility of the data generated. Out of the seventeen co-teachers interviewed, two co-teachers had resigned and were not contactable. One co-teacher had minor concerns with the views expressed in the transcript but after discussion, agreed that no change was needed in the transcript. One participant did not respond despite reminders. Creswell (2012) also suggests that the participants or an external audit could be involved in confirming the analysis process and findings. Hence a peer teaching academic's opinion was sought at different stages of data coding and analysis. During the process there were constructive discussions, but no contradiction of opinions occurred.

3.9.5 Validity and Reliability of the Survey

During the research process a new instrument was developed. The instrument was rigorously trialled in the preliminary stage, followed by an exploratory study. The detailed process of development and validation of the survey instrument (CPES) is discussed in Chapter 4 with further authentication of reliability and validity of CPES using smaller (co-teachers, n=26) and larger samples (students, n=1,111) in Chapter 4 (see Section 4.6.2).

3.10 Summary

This chapter provided a detailed explanation of the research process involved in conducting this study. An overview of epistemology, methods of data collection and analysis, and quality standards were discussed guided by the objectives of this research.

The data were collected from students using a survey (CPES) and eVALUate responses while from teachers using the survey (CPES) and interviews. The qualitative and quantitative data thus collected were analysed to explore the perceptions and experiences of students and co-teachers regarding co-teaching and their insight and strategies for further improvement.

The next chapter presents the rationale and description of development and validation of a new survey instrument (CPES) used in this study to collect the quantitative data, and some qualitative data using three open-ended questions, from students and co- teachers. A comprehensive explanation of statistical analysis of CPES is also described in Chapter 4.

Chapter 4.

Development and Validation of Co-Teaching Perception and Experience Survey (CPES)

4.1 Introduction

This chapter addresses the first research question: Can a valid and reliable tool be developed to evaluate co-teaching perceptions of students and co-teachers in higher education, (Table 1.1) by describing the development and validation of an instrument to assess how students and co-teachers perceive co-teaching pedagogy in a first-year undergraduate core unit in Health Sciences. The instrument developed is titled Co-teaching Perception and Experience Survey (CPES) and its final version has three sections measuring demographics, co-teaching perceptions along five scales with 29 items, and three open-ended questions. The views collected by this survey instrument reveal how students and co-teachers perceive co-teaching and thus reflect the implemented and attained aspect of the conceptual framework underlying this research (Chapter 1, Figure 1.1). This chapter includes an overview of the process involved and theoretical framework employed to develop and validate the instrument, along with presenting the final version of the instrument. The chapter starts with information on various learning environment instruments, explains the need to create a new instrument to assess co-teaching perceptions and experiences of co-teachers and students, and finally provides detailed description of the development and validation of the CPES instrument.

4.2 Theoretical Background

4.2.1 Learning Environment Instruments

There is a rich diversity of valid and reliable instruments available in the literature to assess a variety of learning environments including My Class Inventory (Fisher & Fraser, 1981), College and University Classroom Environment Inventory (Treagust & Fraser, 1986), Science Laboratory Environment Inventory (Fraser, Giddings, McRobbie, 1995) and Questionnaire on Teacher Interaction (Fisher, Fraser & Wubbels, 1993). Table

4.1 summarises several learning environment tools as reported by Fraser (1998) that are frequently used in education to assess different characteristics of a learning environment.

All these learning environment instruments are predominantly dedicated to assessing the psychosocial characteristics of the learning environment led by a single teacher. Thorough research of the literature failed to locate any reliable and valid instrument that was appropriate to meet the objectives of this research study to assess general perceptions and experiences of co-teachers and students in a co-taught classroom.

Some researchers have used self-generated questionnaires to address their research questions, but they are predominantly qualitative and not validated (Hohn, 2010; Mislang, 2011; Reynolds, 2010; Sheldon, 2012). Villa et al. (2004) created a survey instrument 'Are we really co-teachers scale' based on a review of the literature about co-teaching. This instrument consisted of 34 items targeting the actions co-teachers might take to choose a specific co-teaching strategy while co-teaching. Another instrument 'Co-teaching relationship scale' developed by Noonan et al. (2003) investigates co-teacher's beliefs and approaches to co-teaching along with comparison of their personal characteristics in an early childhood and special education environment. Another survey for clinical educators and teacher candidates was developed at the University of Delaware by a co-teaching research team headed by key co-teaching researcher Scantlebury (Drewes, Scantlebury, Soslau & Gallo Fox, 2016) for field testing. It consisted of eight subscales and reported high Cronbach's alpha reliability (0.68 to 0.88).

A gap was identified for an instrument to quantitatively measure the psychosocial characteristics of a co-taught learning environment from the students' and co-teachers' perspectives in a higher education learning environment which is in itself quite different to a school environment in general. Hence there was a need to create a new survey instrument that would relate to the research objectives of the current study and be reliable and validated in higher education context.

Table 4.1

Overview of scales contained in nine classroom environment instruments (LEI, CES, ICEQ, MCI, CUCEI, QTI, CLES and WIHIC) as reported by Fraser (1998)

Instrument	Level	Item per scale	Scales classified according to Moo's scheme		
			Relationship Dimensions	Personal Development Dimensions	System Maintenance Change Dimensions
Learning Environment Inventory (LEI)	Secondary	7	Cohesiveness Friction Favouritism Cliqueness Satisfaction Apathy	Speed Difficulty Competitiveness	Diversity Formality Material environment Goal direction Disorganisation Democracy
Classroom Environment Scale (CES)	Secondary	10	Involvement Affiliation Teacher support	Task orientation Competition	Order & organisation Rule clarity Teacher control Innovation
Individualised Classroom Environment Questionnaire (ICEQ)	Secondary	10	Personalisation Participation	Independence Investigation	Differentiation
My Class Inventory (MCI)	Elementary	6-9	Cohesiveness Friction Satisfaction	Difficulty Competitiveness	
College & University Classroom Environment Inventory (CUCEI)	Higher Education	7	Personalisation Involvement Student cohesiveness Satisfaction	Task orientation	Innovation Individualisation
Questionnaire on Teacher Interaction (QTI)	Secondary / Primary	8-10	Helpful/ friendly Understanding Dissatisfied Admonishing		Leadership Student responsibility & freedom Uncertain Strict
Science Laboratory Environment Inventory (SLEI)	Upper Secondary / Higher Education	7	Student cohesiveness	Open-endedness Integration	Rule clarity Material environment
Constructivist Learning Environment Survey (CLES)	Secondary	7	Personal relevance Uncertainty	Critical voice Shared control	Student negotiation

4.2.2 Co-teaching

In the context of this study, there is a merging of two distinctive fields – co-teaching and the higher education learning environment. In these co-taught classrooms there are two educators who are specialist in their own field. Their personality, pedagogical preference, teaching praxis and belief, teaching experience, and field of knowledge may be different. These factors play a significant role in their interaction with each other and their students. Most co-taught classes are simply a division of duties or roles, with educators teaching a part of the class schedule or a certain number of weeks as the course credit load is divided but not in the true sense of co-teaching, commonly referred to tag teaching (Klein, 2006). Usually this type of co-teaching in higher education is termed tag-teaching. The learning environment of this research study is unique in the sense that both educators are equally responsible for running the whole session collaboratively for a complete semester. Previous attempts to assess the co-teaching learning environment have mainly focussed on its effectiveness, benefits and perception in schools. There was a need to understand the perception of students' and co-teachers' perspective of co-teaching to achieve better understanding of the interaction between the co-teachers as well as between students and teachers in a higher education context.

4.3 Methodology

A common three-staged approach to develop and validate an instrument as suggested by Jegede, Fraser and Fisher (1998) was followed to develop the Co-teaching Perception and Experience Survey (CPES). The survey instrument was designed following the framework of already existing validated questionnaires that comply with educational research protocol.

4.3.1 Stage 1: Identification and Development of Preliminary Scales

Stage 1 consisted of extensively reviewing the literature associated with psychosocial learning environment instruments. The key instruments such as Classroom Environment Scale (CES) (Moos & Trickett, 1974), Constructivist-Oriented Classroom Environment Survey (COLES) (Aldridge, Fraser, Bell & Dorman, 2012), College and University Classroom Environment inventory (CUCEI) (Fraser, Treagust & Dennis, 1986), What Is Happening In this Class (WIHIC) (Fraser, 1998), Learning Environment Inventory (LEI) (Fraser, 1982) and others were studied and fundamental components that would reflect co-teaching interaction were identified. This initial step helped to further identify and narrow

down key components of co-teaching interactions leading to the development of a set of preliminary scales. These scales were considered crucial to gauge any co-teaching partnership. Consequently, the preliminary set of selected scales was reviewed by the two research supervisors and two more teaching staff experienced in learning environment research within the School of Education. Finally, the set of six scales approved by the expert review panel were Teacher support (TS), Teacher collaboration (TC), Teacher Innovation (TI), Student satisfaction (SS), Student Equity (SE) and Student Involvement (SI).

4.3.2 Stage 2: Refining Wording of the Items of Each Scale

During stage 2 of the process, the wording of items under each scale was carefully studied. Since all learning environment instruments are written in the context of a single teacher, the items needed to be reworded for a co-teaching context. Negatively worded or reverse-scored items were recognised, rephrased and assessed. At that stage the instrument was scrutinised by the same panel of experts for face validity of items. My access to a convenience sample of ESL (English as Second Language) and CALD (Culturally and Linguistically Diverse) students to voluntarily participate to test face validity, usability and layout proved to be crucial in finalising the final draft of the instrument.

4.3.3 Stage 3: Field Testing and Analysis of the Instrument

The third stage involved field testing the draft instrument as a preliminary trial. In order to obtain broad and extensive feedback, four different units in Health Sciences where co-teaching was being implemented were recruited. The paper-based survey was planned to be administered in the last week of semester so that students had full experience of observing and experiencing co-teaching. The data thus obtained would then be analysed for factor analysis to identify the items whose deletion would improve the factorial structure of the instrument and in the process make the instrument robust. Furthermore, the data would be subjected to internal consistency reliability analysis (Cronbach's alpha coefficient) to confirm if all the items within a scale measured the same construct.

4.4 The Instrument

CPES was developed based on several learning environment tools (CES, CUCEI, COLES and WIHIC) previously used and established to be reliable and validated in different contexts. The draft instrument consisted of three sections: Section 1 solicited demographic information by means of 13 items. Sections 2 and 3 probed participants' experiences about co-teaching. Section 2 in the draft instrument consisted of 43 Likert-type items on a five-point scale, with choices ranging from '1 for Strongly Disagree' to '5 for Strongly Agree'. Section 3 comprised three free-response questions each of which probed participant's opinions about their co-teaching experiences. Participants were given 30 minutes to respond to the items in CPES. The six scales in the original instrument, the number of items in each scale and an example of an item are provided in Table 4.2.

Table 4.2

Scale description and sample item for each CPES scale

Scales	No. of Items	Example Item
Teacher Support (TS)	7	Both tutors go out of the way to explain concepts to the students.
Student Satisfaction (SS)	8	My learning is better in this class where two tutors teach together.
Teacher Collaboration (TC)	7	Both tutors work in the class as a team.
Student Equity (SE)	7	I am treated the same as all other students in the class.
Student Involvement (SI)	7	I get more opportunity to ask questions in this class with two tutors.
Teacher Innovation (TI)	7	Both tutors think of innovative ways of teaching the content.

Section 2 of the draft instrument comprised six scales taken from various learning environment tools. Table 4.3 represents the origin of each scale and the number of items retained in each scale. The wording in the teacher version was slightly modified to reflect the context of co-teacher's point of view. One of the scale names was also changed from 'Student Satisfaction' to 'Teacher Satisfaction'. An example of these changes is presented in the Table 4.4.

Table 4.3

Original instruments used for each scale of the draft CPES instrument

Scales	No. of Items	Sources
Teacher Support (TS)	7	Classroom Environment Scale (CES) (Trickett & Moos, 1974).
Student Satisfaction (SS)	8	College and University Classroom Environment inventory (CUCEI) (Fraser, Treagust & Dennis, 1986).
Teacher Collaboration (TC)	7	Constructivist-Oriented Classroom Environment Survey (COLES) (Aldridge, Fraser, Bell & Dorman, 2012).
Student Equity (SE)	7	What Is Happening In this Class (WIHIC) (Fraser, 1998).
Student Involvement (SI)	7	What Is Happening In this Class (WIHIC) (Fraser, 1998).
Teacher Innovation (TI)	7	College and University Classroom Environment inventory (CUCEI) (Fraser, Treagust & Dennis, 1986).

Table 4.4

Comparison of students' and teachers' versions of the CPES instrument (original)

Scales	Student Version	Teacher Version
Teacher Support (TS)	Both tutors go out of the way to explain concepts to the students.	Both of us go out of the way to explain concepts to students
Student Satisfaction (SS)	My learning is better in this class where two tutors teach together.	My teaching is better in co- taught classes.
Teacher Collaboration (TC)	Both tutors work in the class as a team.	Both of us work in the class as a team
Student Equity (SE)	I am treated the same as all other students in the class.	Both of us treat all the students same in this class
Student Involvement (SI)	I get more opportunity to ask questions in this class with two tutors.	Students get more opportunity to ask questions in this class with two tutors.
Teacher Innovation (TI)	Both tutors think of innovative ways of teaching the content.	Both of us think of innovative ways of teaching the content.

4.5 Data Collection

In the Faculty of Health Sciences at Curtin University, four first year interprofessional undergraduate core units use co-teaching as the teaching strategy. To obtain a broader perspective about the instrument, the survey was planned to be administered online to all four units towards the later part of the semester (teaching week 8). The timing was planned to give the students maximum time to experience co-teaching. After releasing the online survey for two weeks, despite repeated reminders, a very poor response rate (<10%) from students was registered. After further consultation with my supervisors, a decision was made to administer a paper-based survey in the last week of the Semester 2, 2014 to all four units. One of the units conducts assessment in the last week so permission was not given to administer the survey.

Responses were collected from 528 participants across three units, being 156 student responses from Human Structure and Function (HUMB1000), 175 student responses from Health and Health Behaviour (HHB100) and 197 student responses from Evidence Informed Health Practice (EIHP100). The data thus collected were analysed using SPSS statistical software (v25) for internal consistency reliability and factorial validity.

4.6 Data Analysis

To develop a high-quality assessment tool, it needs to undergo the test of validity and reliability. Reliability refers to the fact that the instrument results are consistent in that it yields similar result if administered to similar respondents in different situations. The higher the stability of an instrument, the higher is the extent of reliability or vice versa. Validity signifies that the instrument measures what it implies to measure (Cohen et al., 2011). Section 2 of the draft instrument had the scales and items that need to be checked for reliability and validity.

Next, Section 2 of the CPES was subjected to item and factor analysis using SPSS (v25) statistical software to provide substantiation of reliability and validity of the instrument and in the process the refinement of the instrument (Walker & Fraser, 2005). For fine-tuning of the instrument, an intuitive-rational strategy (Walker & Fraser, 2005) was employed whereby items with high internal consistency were retained in the instrument. Referring to views of Hase & Goldberg (1967), Walker and Fraser (2005) suggested that internal-strategy decisions further help to refine the instrument where only those items that have high factor loadings on their own scales and low loading on other scales are

retained. Using these two strategies, data were analysed till all the items within a scale had high correlation and factors represented high factor loading. Further details of the analysis are discussed later in the chapter.

4.6.1 Validity

As described earlier in this section, validity refers to the relevance and dependability of the inferences drawn from data in a research context. It is a relative term and any instrument that is valid should be reliable but may not be otherwise (Cohen et al., 2011). To establish that the CPES is a valid survey instrument, factor analysis was conducted with the preliminary trial data collected. Factor analysis is usually conducted to endorse the construct validity and discriminant validity of a new instrument. It is used to investigate the relationship between the items within a scale and also among the other scales of the instrument.

Factor analysis establishes understanding of structure and measurement of latent variables illustrating collinearity of different variables used. To determine the construct validity, factor analysis was conducted on the student responses to part 2 of the draft instrument using principal axis factoring with varimax rotation and Kaiser Normalization (Field, 2005; Walker & Fraser, 2005). Only those items with factor loading of at least 0.4 with their own scale and less than 0.4 with all other scales were selected. Since 6 scales were originally used, hence it was added as another criterion for analysis. This process of elimination helped in scale refinement and construct validation. Table 4.5 represents the factor loading of the original version of 43 items with rotated component matrix.

The factor analysis yielded that all the forty-three items largely loaded onto five scales. The Teacher Support scale had factor loading of all the seven items under one scale in the range of 0.43 and 0.63. The seven items of Student Equity scale also loaded clearly under one scale in the range of 0.40 and 0.75.

Item number 5 of Teacher Innovation scale ‘The seating arrangement of this class is same every week’ had a factor loading of less than 0.4 so was deleted from the scale reducing the number of items for the scale to six. In the Student Satisfaction scale, item number 1 ‘I look forward to coming to this class’ and item number 6 ‘I enjoy learning in this class’ had a factor loading in a new scale. It might be possible that students interpret these statements more as enjoyment of lessons than satisfaction. Both these items were then deleted from the draft instrument. Item number 2 ‘I am satisfied with having two tutors

in class,' had an overlap with the Teacher Support scale, so this item was also deleted. This deletion of three items reduced the number of items for this scale from eight to five. Item number 5 'Both tutors provide support to complete class activities' and item number 7 'Both tutors come prepared to teach the session' of Teacher Collaboration scale had an overlap with Student Equity scale but their loading was more in Teacher Collaboration than Student Equity. Therefore item numbers 5 and 7 were also deleted reducing the number of items for the Teacher Collaboration to five. All the items for the Teacher Collaboration had a factor loading in the range of 0.43 and 0.69.

From my perspective, these are important indicators of an effective co-teaching relationship. The sixth scale of Student Involvement had a confounding result. There was an overlap with a few scales. On careful analysis of language with supervisors and a faculty member with experience in learning environment research, it was presumed that students interpreted the scale differently than anticipated. Consequently, this scale was completely deleted from the draft.

After scrutinising the factorial analysis for construct validity of the draft instrument, another iteration of the data was conducted without the items that were deleted using same validity criteria. It was expected that deletion of a scale and the items discussed above would improve reliability values and generate strong factorial structure. The result was as expected except that Student Equity item number 1 'I get the same amount of help from both the tutors' had a factor loading of less than 0.4, so this item was also deleted from the scale. Table 4.6 represents the factor loading for the refined CPES instrument.

Table 4.5

Factor loading for the original draft of CPES (n=528)

		Factor Loading					
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Teacher Support	1					.514	
	2					.632	
	3					.613	
	4					.551	
	5					.584	
	6					.514	
	7					.434	
Student Satisfaction	1						.605
	2			.533		.400	
	3			.665			
	4			.675			
	5			.439			
	6						.681
	7			.567			
Teacher Collaboration	8			.612			
	1				.648		
	2				.694		
	3				.686		
	4	.438			.639		
	5				.433		
	6	.406			.584		
7				.484			
Student Equity	1	.404					
	2	.714					
	3	.681					
	4	.693					
	5	.736					
	6	.646					
	7	.753					
Student Involvement	1	.415			.422		
	2	.451			.437		
	3		.486	.552			
	4		.452	.519			
	5		.527	.524			
	6		.558	.476			
	7		.530	.574			
Teacher Innovation	1		.657				
	2		.758				
	3		.409				
	4		.696				
	5						
	6		.645				
	7		.473				

Table 4.6

Factor loading for the refined CPES (n=528)

		Factor Loading				
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Teacher Support	1			0.55		
	2			0.66		
	3			0.63		
	4			0.57		
	5			0.60		
	6			0.54		
	7			0.45		
Student Satisfaction	8					0.62
	9					0.64
	10					0.49
	11					0.59
	12					0.70
Teacher Collaboration	13				0.69	
	14				0.69	
	15				0.71	
	16				0.61	
	17				0.53	
Student Equity	18	0.71				
	19	0.68				
	20	0.70				
	21	0.75				
	22	0.66				
	23	0.75				
Teacher Innovation	24		0.66			
	25		0.78			
	26		0.44			
	27		0.72			
	28		0.70			
	29		0.50			
% Variance		16.02	13.70	12.54	11.72	9.27
Eigenvalues		4.65	3.97	3.64	3.40	2.69

*Extraction Method: Principal Axis Factoring.**Rotation Method: Varimax with Kaiser Normalization.**Factor loadings smaller than 0.40 have been omitted*

The final outcome was an instrument with five scales and twenty-nine items that accounted for 63.25% of the total variance for the items analysed. The last row of Table 4.6 presents percentage variance for each scale along with the Eigen values. The scale of Student Equity accounts for the highest proportion of the variance among the

items at 16.02%, closely followed by the Teacher Innovation scale with 13.7% of the total variance. The Teacher Support scale and Teacher Collaboration scale followed closely at 12.54% and 11.72% respectively. Student Satisfaction scale explained another 9.27% of the total variance. The cumulative variance explained by all five scales of the CPES instrument was 63.25% leading to 36.75% of the variance unaccounted for.

4.6.2 Reliability

To evaluate internal consistency reliability of items, Cronbach’s alpha (α) coefficient of CPES instrument was calculated and reported in Table 4.7. Higher inter-rater reliability suggests that all the items under that particular scale measure the same construct. The alpha reliability scales as suggested by George and Mallery (2010) can be categorised by ‘rule of thumb’ ranging from $> .9$ – Excellent, $> .8$ – Good, $> .7$ – Acceptable, $> .6$ – Questionable, $> .5$ – Poor, and $< .5$ – Unacceptable (p. 231). Normal Cronbach’s alpha reliability coefficient value ranges between 0 and 1 suggesting values closer to 1 represent greater internal consistency.

Table 4.7

Reliability coefficient of six scales of original CPES (n=528)

Scales	No. of Items	α -Reliability
Teacher Support (TS)	7	0.91
Student Satisfaction (SS)	8	0.88
Teacher Collaboration (TC)	7	0.93
Student Equity (SE)	7	0.93
Student Involvement (SI)	7	0.93
Teacher Innovation (TI)	7	0.85

Each scale was individually assessed. The internal consistency reliability ranged between 0.85 and 0.93 among the six scales for a sample of 528 students in the preliminary study. Table 4.7 represents the reliability scores for all the six scales. The three scales Teacher Collaboration, Student Equity and Student Involvement have alpha reliabilities as 0.93 and Teacher Support as 0.91. These values are considered ‘excellent’. Student Satisfaction with 0.88 and Teacher Innovation with 0.85 reliability values are considered ‘good’. Overall the instrument presents high reliability scores suggesting that the CPES is a reliable instrument. The reliability of the five scales and associated 29 items of the refined CPES was again analysed for internal consistency after establishing the final

factorial structure. Table 4.8 represents the reliability of all the 5 scales and 29 items of the refined instrument.

Table 4.8

Reliability coefficient of five scales of CPES (n=528)

Scales	No. of Items	α-Reliability
Teacher Support (TS)	7	0.91
Student Satisfaction (SS)	5	0.83
Teacher Collaboration (TC)	5	0.92
Student Equity (SE)	6	0.93
Teacher Innovation (TI)	6	0.88

The internal consistency reliability for the refined CPES instrument ranged between 0.83 and 0.93 among the five scales for a sample of 528 students which parallels with ‘good – excellent’ (George & Mallery, 2010). The alpha reliabilities of scales Student Equity (0.93), Teacher Collaboration (0.92) and Teacher Support (0.91) are considered ‘excellent’ and that of Teacher Innovation (0.88) and Student Satisfaction (0.83) are considered ‘good’.

To further validate the reliability of the CPES, it was analysed using a larger student sample from the main data of the research study. SPSS (v25) statistical analyses of the data were conducted to confirm reliability of scales for internal consistency to confirm all the items in a scale were related as a single construct. The statistical analysis of the five scales revealed a high measure of Cronbach’s alpha reliability values as presented in Table 4.9.

Table 4.9

Reliability coefficient of five scales of CPES (student version) (n=1,111)

Scales	No. of Items	α-Reliability
Teacher Support (TS)	7	0.88
Student Satisfaction (SS)	5	0.85
Teacher Collaboration (TC)	5	0.90
Teacher Equity (TE)	6	0.88
Teacher Innovation (IN)	6	0.86

The alpha coefficient for all the five scales ranged from 0.85 to 0.90. A Cronbach’s alpha reliability coefficient of 0.50 is acceptable and is considered highly reliable if ranges

between 0.70 and 0.90 (DeVellis, 2003). A consistent high alpha value suggests that all the items within each scale measure a single latent construct indicating that students responded similarly to each item in the scale and that CPES is a reliable tool (Cronbach, 1951).

Table 4.10

Reliability coefficient of CPES (teacher version) (n=26)

Scales	No. of Items	α-Reliability
Teacher Support (TS)	7	0.87
Student Satisfaction (SS)	5	0.85
Teacher Collaboration (TC)	5	0.78
Teacher Equity (TE)	6	0.90
Teacher Innovation (IN)	6	0.77

The CPES instrument was further tested for internal consistency to see if all the items were related as a single construct to ensure that the modifications made to the teachers' version had not changed any of the constructs. All the five scales presented high measure of Cronbach's alpha reliability. The values of each scale are shown in Table 4.10. The alpha coefficient for all the five scales of CPES ranged from 0.77 to 0.90. In an exploratory research, Cronbach alpha reliability coefficient of 0.50 is acceptable and between 0.70 and 0.90 is suggestive of high reliability (Cronbach, 1951, DeVellis, 2003).

These values demonstrate that all the items within each scale measure a single unidimensional latent construct indicating that individuals responded similarly to each item in the scale, also demonstrated during preliminary study (Table 4.8) and students' survey analysis (Table 4.9).

4.7 Discussion

This chapter addressed the first research question explaining the design and development of a survey instrument, CPES, in a comparatively new learning environment in higher education, namely co-teaching. The aim was to develop the survey instrument and then subject it to a few trials to establish its reliability and validity. The CPES instrument investigates the implemented and attained perceptions of co-teaching by collecting data in the form of experiences of students and co-teachers. Although co-teaching has been extensively evaluated in many fields such as primary and secondary schools, teacher education, special education and professional development, there is

limited research of co-teaching in higher education. The preliminary trial conducted using CPES with 528 students across three first year Health Sciences core units using co-teaching strategy developed an instrument that demonstrated very strong factorial validity and high internal consistency reliability. The CPES instrument was further subjected to exploratory data analysis with students' (n=1,111) and co-teachers' (n=26) data as the study progressed, and the results have consistently suggested the high reliability of this survey instrument. This survey instrument could further be used in different higher education institutions to provide an evidence-based comprehensive perspective of co-teaching in higher education.

Chapter 5.

Students' Perceptions and Experiences of Co-Teaching

5.1 Introduction

In the previous chapter, development and validation of the new survey instrument CPES (Co-Teaching Perception and Experience Survey) was reported in a preliminary study with a sample size of 528 students enrolled across three Health Sciences core units. All these units had implemented co-teaching as their pedagogical approach. The validity and reliability of CPES was further established by subjecting it to data collected from a larger student sample (n=1,111) and co-teachers (n=26) in HUMB1000 unit. This survey instrument (CPES) was also used to collect data for further investigating students' and co-teachers' perceptions and experiences of the implemented and attained aspect of co-teaching, and also to establish if there were any correlations between co-teaching perceptions and specific demographic variables.

This chapter answers the second research question: What are the perceptions and learning experiences of first year students regarding co-teaching as a pedagogical strategy in HUMB1000, by collecting students' perceptions and experiences of co-teaching as they observed and experienced it while studying this unit. The aim is to collect perceptions of co-teaching for the implemented version, and experiences for attained versions of this pedagogical approach. The quantitative data were collected using the survey instrument (CPES) administered to the students in week 10 of the semester after they had several weeks of exposure to co-teaching (a standard semester runs for 12 weeks). This timeframe seemed to be sufficient to evaluate the co-teaching strategy. The qualitative comments specific to co-teaching in HUMB1000 were collected from the eVALUate survey, which is a university wide survey instrument (Curtin University website). This chapter reports the results and analysis of the CPES survey (Section 5.2) and the eVALUate comments (Section 5.3) and summarises the overall result (Section 5.4) of students' perceptions and experiences of co-teaching.

5.2 CPES – Student Survey

As explained in Chapter 4 (Section 4.4), the final version of the CPES instrument had three sections (see Appendix G). Section 1 consisted of thirteen items collecting demographic information of the participants. Section 2 sought responses from students along five scales of Teacher Support, Student Satisfaction, Teacher Collaboration, Student Equity, and Teacher Innovation on a five-point Likert scale with a total of 29 items. Section 3 consisted of open-ended questions seeking students' responses to three questions:

- a) What do you like about co-teaching?
- b) What don't you like about co-teaching?
- c) What are your suggestions to improve co-teaching in coming years?

Out of the 1,491 students enrolled in this first-year Health Sciences core unit (HUMB1000) at Curtin University, 1,135 students returned the survey accounting for a response rate of 76%. All the data were entered into a Microsoft Excel spreadsheet. Twenty student surveys were randomly chosen and checked for accuracy of data entry. No errors were found in data entry of these student surveys. An identification number was assigned to each student participant (S 01, S 02 S 1,135). On visual inspection of the data, responses of those participants who had either submitted an incomplete survey or had marked a particular response (say 1/2/3/4/5) for all questions were deleted. After cleaning the data, 1,111 valid numbers of participants were retained. The data from these participants were analysed and are reported in this chapter.

5.2.1 Know Your Participants (Section 1)

Responses given by 1,111 student participants to all thirteen questions of Section 1 were analysed using SPSS (v 25). The student data set was from predominantly female (72%) students. The majority were in the age group of 18-20 years (60%), followed by 22 per cent in the age group of 21-30 years. Seven percent were mature age (above 30 years) students and eleven per cent were minor adult (under 18 years) students. Most of the students had joined university directly after secondary school (73%) but students having completed non-university vocational courses (12%) and other university degrees (15%) were also enrolled in the unit.

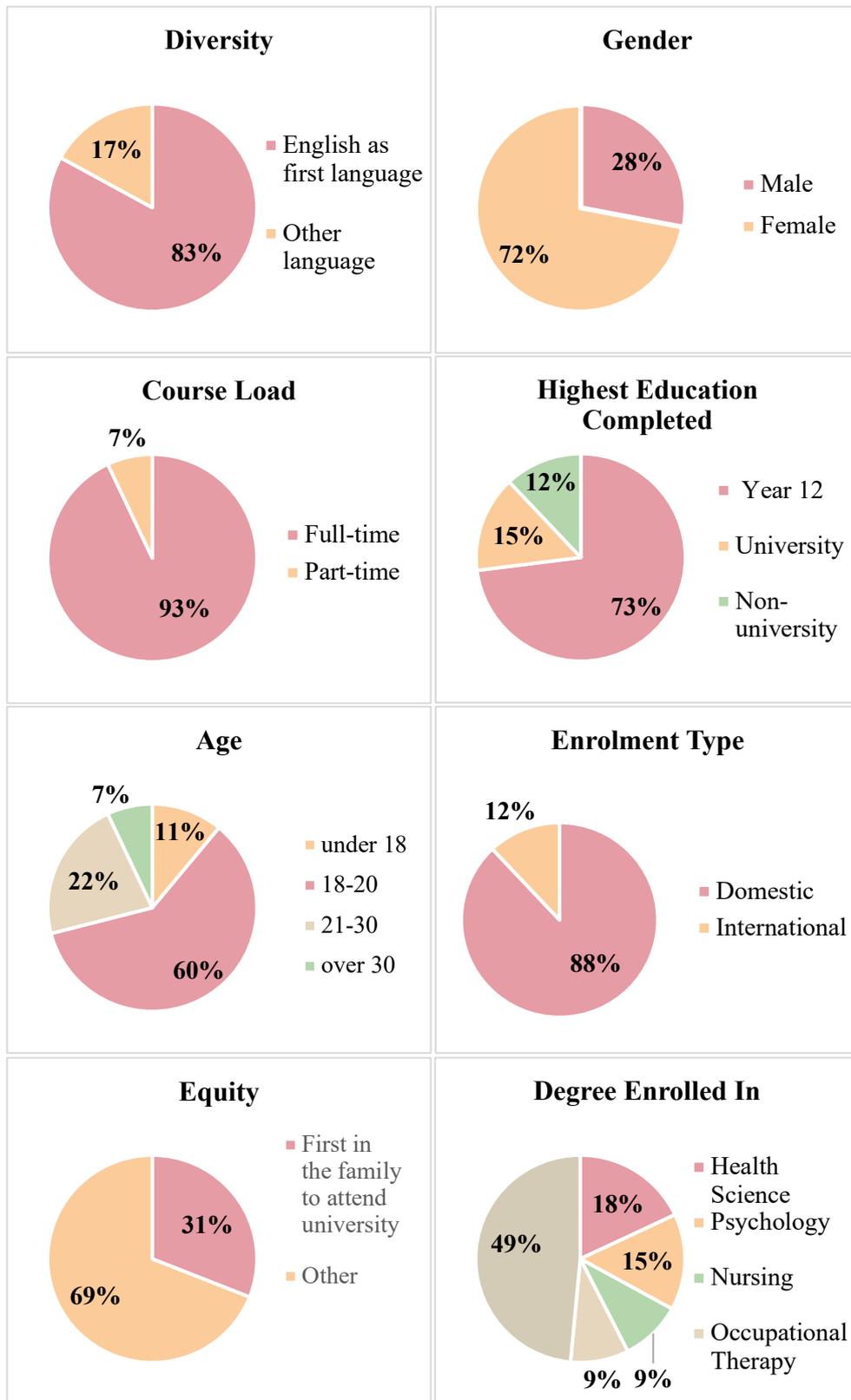


Figure 5.1 Student data set

The majority of the cohort was domestic (88%) full time students (93%) with English as the main language spoken at home (83%). It was interesting to discover that seventeen per cent of students whose main spoken language was not English reported 45

different languages spoken at home. Data from the participants reveals the diversity in the student cohort being multicultural and multilingual with a great variation in age and previous educational qualification.

Survey respondents were enrolled in 35 different courses, mostly from various disciplines of Health Sciences. Most of the students enrolled in Health Sciences were from the generic Bachelor of Health Sciences program (18%) followed by a bachelor's degree qualification in psychology (15%), nursing (9.5%) and occupational therapy (9%) courses. There were also four students enrolled, from courses out of Health Sciences, one from each of the courses of engineering, accounting, arts and creative and graphic design. There were a significant proportion of students (31%) who were first in their family to attend university.

When enquired if they knew that they would be co-taught by two teachers in HUMB1000, 72% of students reported in the negative. Another core unit that delivers content through co-teaching is run in the same semester; hence, when asked if they had experienced co-teaching in other units, 73% of students indicated that they had.

After analysing the demographics of the student cohort, it appears that the majority of the students were not previously exposed to a co-teaching strategy and hence had limited prior understanding or perception of co-teaching. The overall demographics representing the student cohort are summarised in Figure 5.1.

5.2.2 Co-Teaching Perceptions (Section 2)

Section 2 of the survey instrument was developed to collect numerical data from students on their perceptions and experiences of co-teaching based on the five scales of Teacher Support, Student Satisfaction, Teacher Collaboration, Teacher Equity and Teacher Innovation. The students were requested to record their responses on a 5-point Likert scale (1-5) ranging from 'strongly disagree' (1) to 'strongly agree' (5). The data thus collected were analysed using SPSS (v25) statistical analysis software for validation of reliability of scales, descriptive analysis and correlational analysis.

5.2.2.1 Descriptive Statistics

One of the primary aims of this research study is to investigate students' perception and experiences of the pedagogical approach in co-teaching. A descriptive analysis of the quantitative data gathered from students reports their overall perception and experiences of co-teaching using the mean and standard deviation of the five scales. Table 5.1

represents the mean and standard deviations for each of the five scales of the CPES. Since the mean for all five scales of CPES ranges between 3.7 and 4.2, this indicates that students perceive positively all the scales of co-teaching in the instrument.

Table 5.1

Descriptive statistics for the scales of CPES (student version) (n=1,111)

Scales	No. of Items	Cronbach's α-Reliability	Mean	Standard Deviation
Teacher Support	7	0.88	4.19	0.59
Student Satisfaction	5	0.85	3.74	0.82
Teacher Collaboration	5	0.90	4.03	0.74
Teacher Equity	6	0.88	4.20	0.57
Teacher Innovation	6	0.86	3.71	0.70

High mean scores for Teacher Equity (4.20), Teacher Support (4.19) and Teacher Collaboration (4.03) demonstrate that most of the students perceive both their teachers as equals in class, who collaborate well and provide enhanced support in the students' learning process. Although perceived positively, Student Satisfaction (3.74) and Teacher Innovation (3.70) scales reported slightly lower means than the other three scales. Such results could be attributed to the poor teacher-teacher interaction as reported by students and discussed in Section 5.2.3. Moreover, as discussed earlier (Section 3.5.1) content for these interactive sessions is pre-determined, hence there is limited scope to introduce innovation from teachers. However, a lower mean for Teacher Innovation also suggests that students do expect their teachers to adopt more innovative ways to demonstrate the content activities.

The standard deviation for each of the five scales of CPES (Table 5.1) ranged from 0.57 to 0.82. A value of less than one suggests that there is a uniform consistency in students' perceptions and experiences of co-teaching.

5.2.2.2 Inter-Scales Correlation

To validate the strength and linear relationship between the five scales, a correlation analysis was calculated. Scale means were used as a unit of analysis and Pearson's moment correlation coefficient (r) was calculated using simple bivariate correlation. The inter-correlation matrix of all five scales for the data means scores are reported in Table 5.2.

Table 5.2

Pearson Correlation matrix for CPES (student version) (n=1,111)

	Teacher Support	Student Satisfaction	Teacher Collaboration	Teacher equity
Teacher Support (TS)	1	.539**	.712**	.595**
Student Satisfaction (SS)		1	.556**	.418**
Teacher Collaboration (TC)			1	.547**
Teacher Equity (TE)				1
Teacher Innovation (TI)				

** $p < 0.01$

The relationship between the five scales measuring co-teaching perceptions and experiences of students was investigated using the Pearson product-moment correlation coefficient revealing a strong and positive relationship (Cohen, 1988) between all the five scales. The correlation among the scales ranged between 0.71 to 0.42 demonstrating the strongest relationship between Teacher Support and Teacher Collaboration (0.71) and the weakest between Student Satisfaction and Teacher Equity (0.42). The results suggest that if co-teachers exhibit collaboration between themselves, the students feel well supported by their co-teachers and vice-versa.

Conversely, inequity between co-teachers might lead to poor student satisfaction. The analysis also reveals that the relationship between all five scales is statistically significant as all the p-values (2 tailed) are less than 0.01.

5.2.2.3 Association between Variables

Further exploration investigated if students' perception and experiences of co-teaching were influenced by variables such as gender, age and study load. Because the student cohort also contained some international students (12%) and students who were the first in their family attending a university (31%), an analysis was conducted to see if such variables influence the perceptions and experiences of students regarding co-teaching and if the results were any different from the majority of the student cohort.

a) *Gender differences and students' perceptions of co-teaching*

The association between students' perceptions and experiences of co-teaching based on their gender differences was calculated. The total number of participating students (n=1,111) were coded into male (n=308) and female students (n=803). An independent-sample t-test statistical analysis conducted to compare the differences in co-teaching perceptions based on gender did not reveal any significant difference in students' perceptions and experiences.

Table 5.3

Students' perceptions and experiences of co-teaching, by gender

Scale	Mean		Standard Deviation		Differences	
	Male	Female	Male	Female	t	Effect Size (r)
Teacher Support (TS)	4.19	4.20	0.58	0.59	0.08	0.01
Student Satisfaction (SS)	3.72	3.75	0.84	0.82	0.48	0.02
Teacher Collaboration (TC)	4.04	4.03	0.71	0.75	0.18	0.01
Teacher Equity (TE)	4.16	4.22	0.61	0.56	1.65	0.05
Teacher Innovation (TI)	3.67	3.72	0.66	0.71	0.97	0.04

n=1,111; n=308 (Male), n=803 (Female)

The result of the analysis is reported in Table 5.3 specifying the mean, standard deviation and significance value. According to the results, significance values of all scales are greater than 0.05 signifying equal means and hence no significant difference in perceptions and experiences of co-teaching based on gender. Male and female students perceive co-teaching equally as a positive teaching strategy. The effect sizes calculated for all five scales were very low (0.01 to 0.05) further confirming that gender has no impact on perception of co-teaching.

b) *Students' age and co-teaching perceptions and experiences*

The student cohort was divided into five groups according to their age; group 1 (<18 years), 2 (18-20 years), 3 (21-30 years), 4 (31-40 years) and 5 (>40 years). A one-way

ANOVA between-groups analysis of variance was conducted, with age as the independent variable, to explore if students' age has any association with the perceptions and experiences of co-teaching. The results of the analysis are presented in the Table 5.4.

Table 5.4

Descriptive statistical differences in students' perceptions of co-teaching from different age groups (n=1,111)

	Age (Years)	n	Mean	Standard Deviation	F	Eta²
Teacher Support	<18	125	4.13	0.50	2.05	0.01
	18- 20	665	4.17	0.62		
	21-30	243	4.26	0.57		
	31-40	60	4.30	0.46		
	>40	18	4.27	0.65		
Student Satisfaction	<18	125	3.65	0.81	3.51**	0.01
	18- 20	665	3.70	0.83		
	21-30	243	3.79	0.81		
	31-40	60	4.07	0.70		
	>40	18	3.92	1.02		
Teacher Collaboration	<18	125	3.96	0.70	2.55*	0.01
	18- 20	665	3.99	0.76		
	21-30	243	4.13	0.72		
	31-40	60	4.18	0.64		
	>40	18	4.14	0.80		
Teacher Equity	<18	125	4.14	0.52	3.92**	0.01
	18- 20	665	4.18	0.58		
	21-30	243	4.29	0.58		
	31-40	60	4.21	0.58		
	>40	18	4.56	0.45		
Teacher Innovation	<18	125	3.62	0.66	1.61	0.01
	18- 20	665	3.69	0.71		
	21-30	243	3.78	0.69		
	31-40	60	3.80	0.52		
	>40	18	3.78	0.82		

* $p < 0.05$, ** $p < 0.01$

The higher data mean scores suggest that students of all age groups perceive co-teaching positively along the given five scales. The ANOVA results indicate that there is a statistically significant difference at the $p < 0.05$ level in the scales of Student Satisfaction, Teacher Collaboration and Teacher Equity with age.

However, an effect size of this magnitude is considered a very small effect size (Cohen, 1988). In this case, although there was a statistically significant difference between the three scales, the actual difference between the means of scales was very small which is evident from the small effect size obtained. However, with a large sample size, small differences can become statistically significant.

c) Study load and co-teaching perceptions and experiences

An independent-samples t-test was conducted to compare students' perception of co-teaching based on their part-time or full-time study load. The result of the analysis presented in Table 5.5 suggests that there is no statistically significant difference between students' perception and experiences along these scales of co-teaching except for Student Satisfaction ($p = 0.05$). Part-time students report moderately higher satisfaction (Cohen, 1988) than full-time students.

Table 5.5

Students' perceptions and experiences of co-teaching, by study load (n=1,111)

Scale	Mean		SD		Differences	
	Part time	Full time	Part time	Full time	t	Effect size (r)
Teacher Support (TS)	4.28	4.19	0.60	0.59	1.28	0.08
Student Satisfaction (SS)	3.93	3.73	0.85	0.82	2.01*	0.12
Teacher Collaboration (TC)	4.10	4.03	0.77	0.74	0.78	0.05
Teacher Equity (TE)	4.32	4.20	0.59	0.57	1.73	0.10
Teacher Innovation (TI)	3.74	3.70	0.73	0.69	0.48	0.03

d) University experience and co-teaching perceptions and experiences

There was a significant proportion of students (31%) who were first in their families to enrol in a university degree. Hence, an independent-sample t-test was conducted to explore if such a variable would have any impact on how students perceive co-teaching. The result of this analysis is presented in the Table 5.6. The data analysis did not reveal any significant difference in the perception and experiences of co-teaching practice by students who were first in their families to attend any university course.

Table 5.6

Students' perceptions and experiences of co-teaching, by university experience history (n=1,111)

Scale	Mean		Standard Deviation		Differences	
	Yes	No	Yes	No	t	Effect size (r)
Teacher Support (TS)	4.21	4.19	0.59	0.59	0.56	0.02
Student Satisfaction (SS)	3.75	3.74	0.90	0.79	0.18	0.01
Teacher Collaboration (TC)	4.02	4.04	0.77	0.73	0.29	0.01
Teacher Equity (TE)	4.24	4.19	0.57	0.57	1.26	0.04
Teacher Innovation (TI)	3.76	3.68	0.72	0.68	1.88	0.06

e) Student status and co-teaching perceptions and experiences

Another investigation was conducted to explore differences in co-teaching perceptions and experiences of students comparing domestic and international students. The result of the analysis is presented in Table 5.7. There was no significant difference between domestic (Dom.) and international (Intl.) students based on three scales of Teacher Support, Student Satisfaction and Teacher Collaboration. However, there was a statistically significant difference between two groups based on Teacher Equity ($p=0.00$) and Teacher Innovation ($p=0.05$). The magnitude of the difference in their means of both these scales shows a large effect size, Teacher Equity ($r=0.14$) and Teacher Innovation ($r=0.10$). The domestic students see their co-teachers as more equivalent than international students do; however, international students perceive co-teaching more innovative than domestic students do.

Table 5.7

Students' perceptions and experience of co-teaching, by enrolment status (n=1,111)

Scale	Mean		Standard Deviation		Differences	
	Dom.	Intl.	Dom.	Intl.	t	Effect size (r)
Teacher Support (TS)	4.20	4.18	0.60	0.50	0.29	0.02
Student Satisfaction (SS)	3.74	3.75	0.83	0.77	0.08	0.01
Teacher Collaboration (TC)	4.02	4.12	0.76	0.56	1.46	0.07
Teacher Equity (TE)	4.22	4.06	0.57	0.56	3.06**	0.14
Teacher Innovation (TI)	3.69	3.82	0.71	0.60	1.93*	0.10

** $p < 0.01$, * $p < 0.05$

5.2.3 Co-Teaching Perceptions (Section 3)

The third section of the survey instrument sought comments from students for three open ended questions evaluating their perceptions and experiences of co-teaching that directly relate to the research questions. In the following section, the analysis and result of students' responses received to these questions will be expressed. The three questions for which the responses were sought were:

- a) What do you like about co-teaching?
- b) What don't you like about co-teaching?
- c) What are your suggestions to improve co-teaching in coming years?

The following discussion presents students' views in response to the above listed three questions.

5.2.3.1 Positive Experiences of Co-Teaching

The students' comments for liking co-teaching were visually assessed for their responses. Out of a total of 1,111 students surveyed, some students (n=236) had registered no response to this question by leaving it blank. A few students (n=32) responded with a negating comment (e.g. "no idea, n/a, nothing, ?, x, -, not sure..."). Another group of students (n=41) cited adjectives like "it is cool, exciting, everything, interesting..." to express their optimistic view of co-teaching. Some comments (n=23) posted under this question had negative remarks and some (n=9) were not related to co-teaching. The final

Table 5.8

Word frequency for 'likes' of co-teaching

	Word	Length	Count	Wtd. (%)	Similar Words
1	different	9	220	4.70	different, differently, differing
2	opportunity	11	193	3.64	chance, chances, opportunities, assist, assistance, availability, available, help, helpful, helping, helps, support, supporting
3	Help	4	202	3.56	tutor, tutoring, tutors
4	Tutors	6	128	2.74	education, learn, learned, learning, teach, teaches, teaching
5	teaching	8	131	2.13	direct, mean, means, style, styles,
6	Ways	4	86	1.78	doubts, question, wonderful
7	questions	9	83	1.77	student, students
8	students	8	76	1.62	feel, feels, opinion, opinionated, opinions, thoughts, view, views
9	opinions	8	95	1.39	class, classes, course, form
10	Class	5	64	1.35	check, hear, hearing, know, knowledge, knowledgeable, learn, learned, learning, read, studies, study, take, watching
11	learning	8	99	1.23	explanation, explanations
12	explanations	12	56	1.20	perspective, perspectives, positive, view, views
13	perspectives	12	80	1.18	teacher, teachers
14	teachers	8	54	1.15	comprehensively, read, understand, understanding
15	understand	10	54	1.12	multiple, time
16	Time	4	48	1.03	answer, answered, answering, answers, response, responses, resulting
17	answer	6	44	0.92	best, better, improve, improves
18	Better	6	41	0.83	explained, explaining, explains
19	explain	7	39	0.83	interact, interacting, interactive
20	interaction	11	38	0.81	beneficial, depending, effective, expert, experts, good, just, respect, respectful, skill, skills, thorough,
21	Good	4	56	0.81	idea, ideas, mind, minds, thoughts
22	Ideas	5	39	0.79	bring, form, make, makes, solve, solving, studies, study, turns, work, worked, working, works
23	Work	4	49	0.72	contribute, give, giving, hands, open, make, makes, opening, opens, present, presented, presenting, feedback
24	Gives	5	52	0.71	feedback
25	feedback	8	31	0.66	experience, experiences, feel, feels, getting, know, lively, receive, received, receiving
26	experience	10	50	0.65	People
27	people	6	30	0.64	change, diverse, diversity, form, individual, individually,
28	variety	7	34	0.63	individuals, person, personal, personalities,
29	someone	7	29	0.62	direct, level, levels, point, points, show
30	points	6	33	0.59	

a) *Diversity*

The first thematic category of diversity was developed based on the initial most frequently used word ‘different’ which accounted for 4.7% of the total word count of the students’ comments. The theme of diversity pertained to students’ reflection of their exposure to a range of skills and practices. The students’ comments revealed (see Appendix J) how they felt enriched by experiencing the various teaching methods/styles of their co-teachers. The students also acknowledged how experiencing different perspectives and opinions, and different ways of explaining the same content but in different contexts, extended their knowledge and understanding of content. The knowledge sharing with their teachers having different backgrounds, experiences and expertise further enhanced their positive learning experiences (Kerridge, Kyle and Marks-Maran, 2009). Recognizing the diversity in learners, students also appreciated the variety in their teaching cohort with teachers engaged from varying backgrounds and experiences bringing their own expertise to the learning process as evident from the following student comments.

- S144 allows for different explanations for the same topic, helps if you don't understand one approach and need another explanation*
- S329 different info from different people with different background*
- S650 different personalities of tutors, more than one point of view, different teaching styles*
- S769 different explanations for broader range of students*

The students not only appreciated the diversity in teaching personalities, perspectives, experiences and styles but also reported that such diversity was better for their learning (Ferguson & Wilson, 2011).

- S164 different opinions and styles of teaching that can help me to learn, even if I can't learn from one tutor, I still have support of the other*
- S185 there is a wide range of ideas, opinions present which makes the subject eye opening and opens up our mind to a wider range of ideas*
- S244 each tutor comes with different perspectives that add variety with concepts, ideas and teaching*
- S543 both have different histories & provide info at different levels*

b) Student-teacher interaction

The second major theme developed from students' comments was 'student-teacher interaction' based on students' perception that they had more opportunities for interaction and to ask questions. The word "opportunity" accounted for 3.64% of student comments. The students reported that the presence of two teachers working together provided them with more opportunities to interact with their teachers and get answers to their questions in a timely way. They suggested that co-teaching improved the student to teacher ratio (Bacharach et al., 2008) creating more accessibility of teachers to students during the learning process in classes. There was less time lost or questions left unanswered due to a lack of teacher student interaction.

S103 more accessible to ask questions in case the other teacher is busy with someone else

S127 gives me more one on one time when completing activities – I can ask questions when I need help & get answers quickly

S233 it gives more opportunities to ask questions and receive feedback

S509 more ability to interact with tutors

S950 one teaches other handles student doubts, more interaction

S1107 more communication with tutors & feedback

The students said that their learning needs were met when they had more chances to interact with their teachers, receive help and get prompt feedback.

c) Teacher support

The third major theme generated from students' feedback was that they perceived co-taught sessions provided them with a lot of support in their learning journey. Such extra support due to the presence of one more teaching professional enhanced their opportunities to learn better (Simpson, Thurston & James, 2012). The students reported that they not only felt that their questions were quickly responded to but also appreciated that if there was any information left out by one teacher, it was covered by the other. Also if the teaching style of one was not compatible with their learning style, there was another option available and they could seek help.

S31 if you don't understand the explanation of one tutor, then other can explain in more depth, one will be bound to have a way of teaching suited to my way of learning

S73 always someone around to answer a question, more supervision

- S125 more opportunity to ask questions, more encouragement, may explain things differently to help me learn*
- S156 both tutors explain ways on how to remember information, fill in blanks for each other if they forget any information*
- S161 if one teacher does not know something, the other one does, one might explain a concept better than the other*
- S178 more teachers available to assist with questions and learning*
- S387 students' needs met quicker, good to have two explanations*
- S763 bounce ideas off each other, more answer & explanations*
- S777 better interacting tutors make it easy to catch up, one reminds other if misses anything*

d) Better learning environment

The fourth major theme to emerge was linked to the other three themes of diversity, student-teacher interaction and teacher support. Students reported that the co-taught sessions were not boring and monotonous because of the swapping of roles between co-teachers, and different teaching tones. By observing the professional behaviour like bouncing ideas off each other, productive discussion on opposing views, teamwork and respect for each other despite varying views, it created a better learning environment and set professional standards for the students (Birrell & Bullough, 2005). The camaraderie between the co-teachers created a less stressful and more flexible environment conducive to learning.

- S52 more help, less stress, better learning environment*
- S124 more opinions for support & encouragement, more teacher student time, combines styles & ideas of each other to create more effective work environment*
- S166 makes it more fun, easier to learn*
- S268 more attention, two experts working together is better than one*
- S364 constant change keeps you more focussed*
- S573 class is not boring, one person not talking all the time*
- S634 class environment is more casual*
- S737 refreshing, teamwork creates respectful environment*
- S977 watching them collaborate improves my experience*
- S1066 like flexibility & inclusive approach*

A relaxed, interactive and supportive learning environment enriched by a blend of teachers with diverse experiences, backgrounds, and expertise and teaching styles supports a positive teaching strategy.

5.2.3.2 Challenging Experiences of Co-Teaching

In response to the second question of what students did not like about co-teaching, 31% of total responding students (n=342) did not write any response and left it blank. Further exploration of the comments revealed that an almost similar number of students (n=334) did not have any judgement comments by citing words like “nothing really, n/a, nil, none ...”. Some of the comments cited by students were not related to co-teaching (n=42) like “large class size, have to remember two names, less time for activities...”; others were positive comments (n=25) and some even referred to challenges of co-teaching in other units (n=7). The total number of assessable comments of students’ perception of challenges of co-teaching were n=361 (32.5%).

A word cloud was also generated for 30 most frequently used words in the students’ comments and the result is displayed in the Figure 5.3.

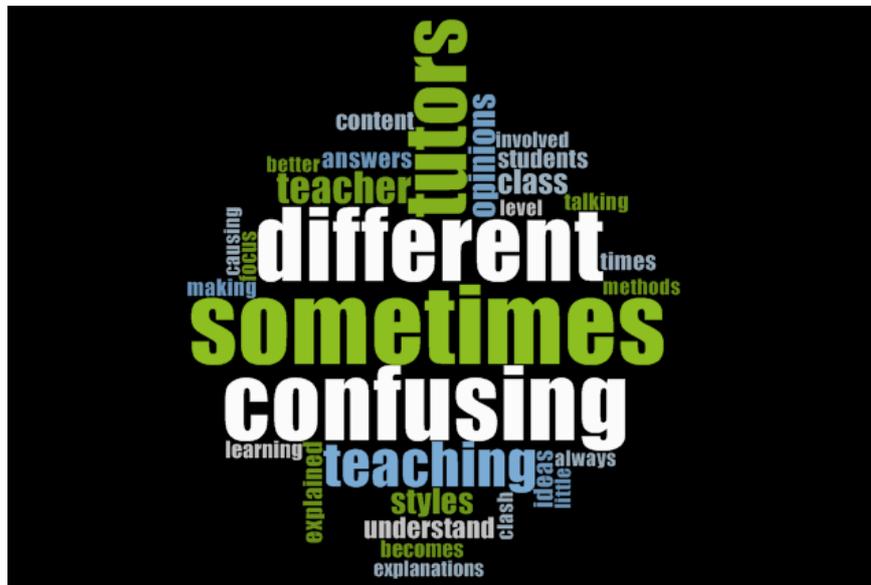


Figure 5.3 Word cloud generated for challenges of co-teaching

Table 5.9

Word frequency for challenges of co-teaching

	Word	Length	Count	Wtd (%)	Similar Words
1	sometimes	9	105	5.47	Sometimes
2	confusing	9	101	5.16	confuse, confused, confuses, confusing, confusion, confusions, disjointed
3	different	9	103	5.08	conflict, conflicting, differ, difference, differences, different, differently, disagree,
4	tutors	6	79	4.12	tutor, tutors
5	teaching	8	57	2.73	education, instruction, learn, learning, teach, teaching
6	teacher	7	33	1.72	instructors, teacher, teachers
7	opinions	8	31	1.28	feeling, feels, opinion, opinionated, opinions,
8	Styles	6	23	1.20	style, styles
9	Class	5	22	1.10	class, classes, separate
10	understand	10	18	0.83	clear, clearly, interpretations, reads, understand, understanding
11	answers	7	14	0.73	answer, answering, answers, respond
12	Ideas	5	14	0.73	Ideas
13	explained	9	14	0.70	explain, explained, explaining, interpretations
14	students	8	13	0.68	student, students
15	content	7	14	0.67	argue, arguments, competition, content, contents, messages, subject
16	Times	5	12	0.63	multiple, timed, times
17	making	6	20	0.55	build, clear, clearly, create, creating, established, makes, making, prepare, prepared, takes, taking, worked, working,
18	talking	7	10	0.52	lecturer, speak, speaking, talking, talks
19	learning	8	17	0.51	knowledge, knowledgeable, knows, learn, learning, reads, takes, taking
20	Focus	5	11	0.51	concentration, direct, focus, focussed
21	becomes	7	11	0.50	become, becomes, going, seems, turns
22	always	6	9	0.47	Always
23	better	6	9	0.47	better, improve
24	Clash	5	9	0.47	clash, clashes, clashing
25	Level	5	11	0.47	charge, equal, level, levels, points
26	Little	6	9	0.47	little, slightly, small
27	methods	7	9	0.47	method, methods
28	causing	7	11	0.44	cases, cause, causes, causing, makes, making
29	involved	8	12	0.44	affected, engage, engaging, interest, taking interesting, involved, involvement, requires,
30	explanations	12	8	0.42	explanation, explanations

The assessable comments (n=361) reflecting students' opinions for not liking co-teaching were uploaded into NVivo Pro (v11) software for further analysis. A word frequency search was conducted for the whole document setting a criterion to display the 30 most frequently used words with a minimum length of five letters after trialling a few iterations to capture the best responses. The grouping was set up to the 'synonyms' conditions to include similar words. The result of such word frequency search is displayed in Table 5.9.

The three most frequently used words to express dislike for co-teaching were "sometimes" (5.47%), "confusing" (5.16%) and "different" (5.08) followed by "tutors" (4.12%), "teaching" (2.73%) and "teacher" (1.72%) To further analyse the occurrence and relevance of these words, a text search was conducted. Reading and reviewing all the comments critically a few times revealed that the issues raised were not a persistent occurrence but reported occasionally, hence high occurrence of the word "sometimes".

The following student comments would present an idea of the variety of observations that happened occasionally.

- S338 sometimes gets confusing*
- S419 sometimes one overshadows other repeating info*
- S478 sometimes give diff answers*
- S480 sometimes is unorganised, can tell when one does not like other*
- S856 sometimes hard to coordinate 2 diff tutors in allotted time*
- S945 sometimes both have different opinions*
- S494 sometimes both of them may disagree*

Further analysing the students' comments revealed two major themes for displeasure towards co-teaching namely conflict and diversity.

a) Conflict

Most of the students' comments illustrated that they were disappointed by witnessing conflicts between their co-teachers arising from different reasons (Ferguson & Wilson, 2011; Graziano & Navarrete, 2012). Some of the comments reflected conflicts arising due to unprofessional behaviour of one or both co-teachers. It created confusion in class when the co-teachers were either not fully prepared with the content or did not show respect for each other.

- S64 Sometimes one can talk over the other & it is uncomfortable*
- S210 can get a bit confusing if tutors are talking over each other*

- S214 sometimes they don't come prepared together & get confused about what each other is going to say*
- S508 both tutors need to know more than students*
- S554 sometimes it feels there is competition*
- S638 arguments between tutors confuse me*
- S749 if no chemistry between tutors, it is hard to enjoy class*
- S800 cohesion between tutors can compromise teaching quality*
- S910 some are antagonistic towards each other*

A lack of parity between co-teachers was also inferred by students when either one appeared to be dominating the other or one of the dyad did not show any initiative to teach and interact with students.

- S141 one tutor talks for first half while the other stands idle*
- S202 at times only one does most of talking, so don't get other teacher's perspective*
- S476 one often dominates, structure falls apart if one is absent*
- S485 one can dominate other creating awkward feeling*
- S570 one teacher is stronger than other & is seen as better teacher*
- S575 competence of both tutors is not at the same level, can make it difficult to ask qs*
- S1069 one is enthusiastic & other difficult to understand*

The students reported confusion where they were not able to establish role clarity between their two teachers. The interaction between co-teachers neither displayed parity nor a leader/dominant teacher. This created confusion for students about the authority figure in class as the roles were not pre-assigned based on the content to be discussed.

- S68 gets confusing with who's teaching what*
- S124 confusing if roles are not clearly established, unorganised*
- S511 it feels that they divided it up right before class*
- S524 confusing sometimes whom to ask qs.*
- S798 confusing who is main tutor*
- S817 never know whom to ask for help*

b) Diversity

Some student comments (5.08%) expressed displeasure about co-teaching due to diversity in teachers' teaching behaviours and approaches. Interestingly, many student comments (4.72%) previously reflected in the positive aspects of co-teaching (Section 5.2.4) that such diversity proved to be helpful in their learning journey. Such conflicting remarks suggest that different students appreciate different teaching styles.

Some students prefer discussion about various perspectives of a topic before making any inference, whereas, others prefer a clear answer. Students reported that they felt confused when teachers presented different views, interpretations or explanations of a particular topic.

- S15 tutors sometimes have different explanations of a topic which can be confusing*
- S491 confusing, sometimes interrupt each other, diff teaching methods & opinions*
- S665 2 diff perspectives can sometimes be confusing*
- S997 opinions can clash sometimes causing confusion*

Students also found challenges to switch between two different teaching styles of co-teachers which was compounded when there was no collaboration or coordination between the two co-teachers. The ‘You teach, I teach’ approach exhibited by some co-teaching pairs was also not liked by students.

- S140 becomes confusing sometimes, may as well have one tutor as they just teach different sections of the class instead of all of class together*
- S653 confusing views, frustrating to split attention between two*
- S656 tutors sometimes have varied ideas at how to run lesson*
- S690 diff teaching styles are confusing seems to fight for attention*
- S890 disorganised tutors with clashing ideas*

Some students did not like co-teaching because of their inherent preference for single teacher teaching and had trouble swapping focus between two teachers. They also feel that it is often easier to build rapport with one teacher than with two teachers in a single teaching space.

- S38 easier to build focus and rapport with one teacher*
- S311 harder to build student teacher relationship*
- S431 may be overwhelming to some students*
- S498 easier to bond with one than two*
- S714 having to divert attention between 2 teachers, easier with 1 person*
- S924 sometimes lose focus when tutors suddenly swap*

This suggests that when students find gaps or discrepancies in teachers’ teaching behaviours and professional attitude, they feel that it impacts on their learning process.

5.2.3.3 Suggestions to Improve Co-Teaching

On analysing students' comments for the third question as to how to strengthen co-teaching in future, the total assessable comments accounted for 25% (n=274) of overall student comments. The number of students that did not leave any comment were n=421, whereas, some students (n=271) did not express any view by stating responses like “-,x, ?, nothing, don't know”. Some suggestive comments (n=56) were not specifically directed towards co-teaching like “smaller classes” and “more time”. Although there were some encouraging comments (n=63) like “keep it up” and “implement in other units” but there were some discouraging comments (n=23) as well like “don't do it” and “independent teaching is better”. There was mention of a few comments (n=3) for other units that have implemented co-teaching.

A word cloud was also generated for the 30 most frequently used words in the students' comments and the result is displayed in Figure 5.4.

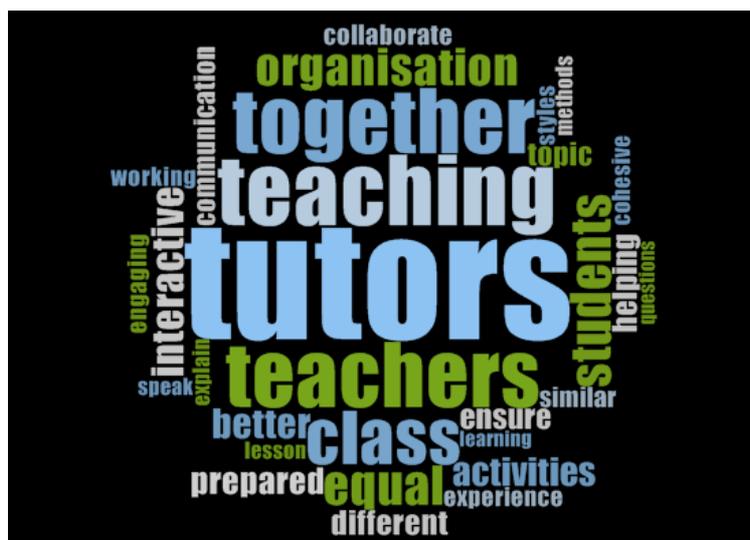


Figure 5.4 Word cloud generated for suggestions to improve co-teaching

The three most frequently used words were “tutors” (5.34%), “teaching” (3%) and “teachers” (2.74%). To further understand students' perspective, a text search for the first ten frequently used words was created and critically reviewed. The students' suggestions to improve co-teaching could be categorised under four major themes of collaboration, purposeful pairing, professional behaviour and student interaction. The students liked co-teaching but with a condition *as long as tutors work well together and present good dynamics* (S55).

Table 5.10

Word frequency for suggestions to improve co-teaching

	Word	Length	Count	Wtd (%)	Similar Words
1	tutors	6	80	5.34	tutor, tutoring, tutors
2	teaching	8	49	3.00	educated, learning, teach, teaches, teaching
3	teachers	8	41	2.74	teacher, teachers
4	together	8	41	2.74	Together
5	Class	5	34	2.19	class, classes, course, separately
6	students	8	24	1.60	student, students
7	equal	5	25	1.54	equal, equality, equally, evenly, level, match
8	organisation	12	30	1.45	direction, organisation, organised, preparation, prepare, prepared, system,
9	interactive	11	18	1.20	interact, interaction, interactive
10	better	6	17	1.08	advance, better, improve, improved
11	activities	10	15	1.00	activities, dynamics, exciting
12	prepared	8	28	0.93	develop, educated, planning, plans, preparation, prepare, prepared, train, training
13	different	9	13	0.83	conflict, differences, different, disagree
14	ensure	6	13	0.80	control, ensure
15	helping	7	14	0.80	assist, assistant, assisting, assists, available, facilitating, helping, support, supportive
16	topic	5	12	0.77	matter, topic, topics
17	communication	13	10	0.67	communicate, communication
18	collaborate	11	13	0.63	collaborate, collaboration, cooperate, cooperation, cooperative, partners
19	similar	7	9	0.60	Similar
20	engaging	8	13	0.59	conflict, employ, engage, engaged, engagement, engaging, involved, involvement, operatively, taking
21	experience	10	11	0.58	experience, experienced, feels, getting, knows
22	working	7	13	0.58	bring, employ, going, operatively, running, turns, worked, working, works
23	cohesive	8	8	0.53	cohesion, cohesive, cohesively
24	styles	6	8	0.53	manner, style, styles
25	explain	7	7	0.47	explain, explaining
26	lesson	6	7	0.47	lesson, lessons
27	methods	7	7	0.47	method, methods
28	speak	5	9	0.47	speak, speaks, talking, talks
29	learning	8	11	0.41	knowledge, knowledgeable, knows, learning, taking
30	questions	9	6	0.40	Questions

All the assessable comments (n=274) were then analysed using NVivo Pro (v11). A word frequency search was conducted for the whole document setting a criterion to display the 30 most frequently used words with a minimum length of 5 letters after trialling a few iterations to capture the best responses. The grouping was set up to the ‘synonyms’ conditions to include similar words. The result of such word frequency search is displayed in Table 5.10.

a) Collaboration

The students highly regarded the collaboration between both co-teachers. They suggested that collaboration and communication is paramount for success of co-teaching. Most of the students recommended that to demonstrate teamwork, both co-teachers should plan together before class, allocating roles according to their strengths. They should teach together rather than splitting the content into half with smooth transition while teaching. In class they should support each other rather than compete for attention. Also the roles should be equally shared without taking turns. Such observation suggested that the students also did not prefer ‘you teach, I teach approach’ but favoured a more shared teaching approach. The following comments support the first theme that co-teachers need to collaborate and plan prior to co-teaching in class, during teaching and even reflect together after the class.

- S34 need to interact more with each other, need to help the other when it is obvious class is not understanding concepts*
- S35 make sure the tutors both go through what they will be teaching and have a similar understanding*
- S144 prepare class together. Avoid one tutor doing first hour & the other the second hour*
- S190 work together more to create a workshop- usually teachers just take turns in talking rather than doing it together*
- S644 decide on who talks when to make it less confusing*
- S928 more communication between tutors outside class*

The students observed that co-teachers were deciding roles on the spot in class hence the following suggestions.

- S436 prepare collaboration & teaching plan before classes*
- S488 pre-briefing to develop bonding & team work strategies*

A few interesting suggestions recommended were to alternate the lead roles of the co-teachers in different weeks so that both get equal opportunities to lead and to support.

- S235 *might be worthwhile having one tutor lead a topic and then the other tutor next week. So different styles are less disruptive*
- S597 *rotate teacher combination each week, main teacher stays same but co- teacher changes*

b) Purposeful pairing

Students also commented on developing collegiality and camaraderie between the co-teachers. Suggestions were indicated to improve collaboration between co-teachers by pairing them purposefully based on various criteria. Different suggestions provided to pair co-teachers were based on gender, age, experience, affinity, familiarity, pedagogical beliefs etc. The following student comments justify such consideration.

- S17 *Choose teachers who get along and can work together. Have both male & female teachers*
- S79 *teachers who know each other & their teaching methods teach together to work well together*
- S171 *pair people with different characteristics to ensure needs of all learners are met*
- S489 *pair tutors with same age but different background for better cohesion & different perspectives*
- S623 *get tutors together that know each other & have good chemistry*

This theme was summarised by S1021 who stated that “pair tutors on basis of personality, skills, experience & methods”.

c) Professional behaviour

A large number of students also suggested that co-teachers need to display professional behaviour at all times while co-teaching in class. Both partners need to display teamwork, active engagement with students, content preparedness, parity and respect for each other. It was also suggested that awareness of who is teaching what and when would make the pair work effectively.

- S149 *must work cohesively with one another*
- S165 *the teachers to not get confused*
- S214 *be more prepared together for class*
- S223 *make sure both co-teachers are of equal dominance so that one is not always leading the other*
- S570 *ensure both are strong & can bounce off each other*
- S637 *equal respect, support & roles*
- S1014 *ensure amiable relation between co-teachers for smooth running*

The students even suggested that if co-teachers were less experienced, they could be provided with some training.

S690 ...more tutor training

S1081 increase training for less experienced tutors

d) Student-teacher interaction

Although students appreciated co-teaching and the efforts of co-teachers, they suggested more student interaction to further improve co-teaching. The comments mentioned below were given by students reflecting on the need for better student engagement and feedback.

S316 be more available to help students

S353 be more interactive, more fun

S574 have both focus on giving student feedback & helping

S673 have one tutoring & other walking around assisting students

S767 more interaction between tutors, engage all students

Currently, the class activities are designed based on content and co-teachers teach around it. A student (S1057) suggested to “design course around it for smooth flow”. Another student (S712) suggested “more info on this model of teaching to us”. However, overall suggestions could be summarised as to have “better educated staff, more engaging” (S309), “both teachers well prepared in working together” (S470) ensuring “teaching duties are shared equally” (S476).

5.3 Student eVALUate

As reported earlier in Chapter 3 (Section 3.7.2.2) “eVALUate is Curtin's online system for gathering and reporting students' perceptions of their learning experiences” (Curtin University website). eVALUate is a generic and standardised survey instrument that gathers students' responses to their perception of;

- i) units – factors that promote or impede their learning and
- ii) teachers – for their teaching effectiveness.

The surveys are automatically released to all undergraduate and postgraduate coursework students across all campuses, domestic and offshore. The students voluntarily and anonymously respond to the survey. For this research study, qualitative comments from the eVALUate survey for unit evaluation were considered. This survey is a standardised instrument and opinions are not specifically sought for co-teaching, but it was presumed

that students will record their opinion to the newly encountered teaching strategy. Since only unit coordinators have access to the survey responses, permission was sought to use comments specific to co-teaching albeit maintaining anonymity of the co-teachers.

Out of an enrolment of 1,491 students, 712 students responded to the eVALUate unit survey accounting for a 48% response rate. The qualitative survey comments required students to register their responses for unit evaluation to two main queries:

10. Please comment on the most helpful aspects of ‘Human Structure and Function (HUMB1000)’

11. Please comment on how you think ‘Human Structure and Function (HUMB1000)’ might be improved.

After reviewing the eVALUate unit survey, comments mentioning co-teaching and co-teachers were visually scrutinized, highlighted and filtered onto a separate Microsoft Word document. On further scrutinising the data reflecting on various aspects of co-teaching and co-teachers, the selected comments were then categorised into three clusters based on students’ perceptions of i) what they liked, ii) what they did not like and iii) how co-teaching could be improved. The core aim for choosing these clusters was to address the research questions underlying this research study. The students’ comments representing each cluster were repeatedly scrutinised manually to segregate them into further categories and themes. Since the comments are anonymous and students are not required to submit comments for both queries, the participant students were titled as A1, A2, ..., A160 for likes, B1, B2, ..., B55 for dislikes and C1, C2, ..., C28 for suggestions. All the comments were analysed manually using grounded theory (Creswell, 2012). Using different coloured highlighters, student comments were colour coded for various categories and then suitable themes were generated. The results of each category analysis will be discussed separately in the following discussion.

5.3.1 Positive Experiences of Co-Teaching

In response to the first query of what the students liked about HUMB1000 (HSF100), 160 student comments mentioning co-teaching or interaction between two teachers or students and teachers were selected reflecting 22.5% of the total eVALUate remarks. All those comments reflecting on co-teaching or both co-teachers were selected. However, students’ observations remarking on only one of the co-teaching dyad were not considered. 52 out of 160 students’ comments (32.5%) were general in reference to co-

teaching without mentioning anything specific. Students appreciated the presence of two teachers or good co-teachers or interesting workshop arrangement. Some of the comments mentioned below reflect such sentiment; in general, they considered co-teachers helpful.

- A41 Dual teaching system was a breath of fresh air as assistance was offered more often than not*
- A50 The co-teaching of the unit is beneficial with the amount of information we are taught*
- A103 The co-teaching style of learning is also highly effective.*

However, the students were also aware of the challenges that could jeopardise the effectiveness of this strategy as evident from the following comments.

- A1 Another thing I enjoyed was the co-teaching experience. Provided that there is a good relationship between the two instructors, I feel that it is much more effective in the workshop than having one. xxxx and xxxx certainly exemplified this, however I've been present at other workshops where the relationship was more towards the dominant teacher. This was awkward for the group*
- A81 The co-teaching is great when the tutors are compatible.*

On deeper analysis of student comments many categories emerged which were then summarised into themes.

a) Teacher support

The students overall felt well supported by both co-teachers in their co-taught sessions and 30.6% student comments (n=49) expressed such opinions. Availability of two teachers impacted student to teacher ratio providing students with more opportunities for one on one interactions.

- A47 Having two teachers in the class is very helpful especially xxxx and xxxx. These teachers were able to talk to the whole class while also helping one on one with students. They did not make the class boring, and it made me want to get up at 5:45am to come to class for 8am. The most helpful aspects of the class were definitely having 2 teachers, a smaller class, workshop material and hands on activities to understand certain concepts. The fact that the class wasn't boring made me want to participate and learn more.*
- A92 Having two teachers in each class improved my learning experience. It allowed students to ask a question while the*

other teacher continued teaching the class. It also allowed more one-on-one learning which was useful when challenging topics were being discussed

The students appreciated the presence of two teachers because it gave them more opportunities to ask questions. The friendly and approachable behaviour of co-teachers made them more available and welcoming to students.

A146 Two tutors in a class help the student to accommodate their questions properly, I enjoy the class because the tutors are friendly and approachable as well as very knowledgeable in the topic.

The students not only felt supported for content related queries but also for other factors that could impact on their learning otherwise. The learning seemed to be more authentic as it was related to real life examples cited by the experienced co-teachers in their respective fields. The two teachers from different fields seemed to complement each other providing students more confidence and ease of learning.

A22 good manner of addressing the class, nice and approachable in terms of needing help or talking about issues with the content or person life effecting your work. xxxx- Uses life experiences to explain the content contextually which helps to flesh it out and make it easier to apply our unit information to real world examples.

A65 As difficult as it may be sometimes, xxxx and xxxx always manage to help everyone understand the concepts with their easy to listen to teaching skills. xxxx especially is one of a kind teacher, and manages to explain things very easily. xxxx is simply full of knowledge and very interesting to listen to.

b) Professional behaviour

The display of professional behaviour during co-teaching was greatly valued by the students. Professional behaviour is defined as “behaviour based on a systematically organised and transferrable knowledge base expressing the values and norms of the professional community” (Lunenberg, Dengerink & Korthagen, 2014, p. 6). In addition to content knowledge and application perception, the professional behaviour also encompasses ethical values and norms. Some students (n=28, 17.5%) commented that their co-teachers were not only well versed in the subject content knowledge and application but also easily approachable due to their professional behaviour in class.

- A3 *The workshop teachers were great, very dynamic, enthusiastic and helpful. Their teaching really helped my understanding of the material*
- A76 *The teachers for Human Structure and Function are generally approachable and helpful, based on my experience with having xxxx and xxxx as my teachers for the unit. They know what they are talking about with their need to check their resources only happening rarely. Their explanations of the topics are adequate and very straightforward, which helps in providing more time and opportunity for other students to ask questions.*
- A132 *My tutors go through each compendium well and address all the information that we need to know for tests and also the exam. They also ask lots of questions and engages with the class.*
- A142 *My two tutors were excellent, very knowledgeable and working extremely well together from their respective fields. xxxx and xxxx brilliant!*
- A146 *Two tutors in a class help the student to accommodate their questions properly, I enjoy the class because the tutors are friendly and approachable as well as very knowledgeable in the topic.*

Non-judgemental and friendly behaviour from co-teachers was seen as welcoming by students, prompting them to ask questions and supporting an interactive process of learning.

c) Better learning environment

The learning environment research literature reports studies associating students' learning outcomes with perception of their learning environments (Henderson, Fisher & Fraser, 2000; Lizzio, Wilson & Simons, 2002). Students who feel encouraged to ask questions in a non-threatening and trustworthy environment engage better in their learning process resulting in better learning outcomes. Lizzio, Wilson and Simons (2002) in their study of university students' perception of their learning environment and academic outcomes, found that a good teaching environment influences students towards deeper learning and higher academic achievements. It also influenced development of positive academic and workplace skills. A positive learning environment that was enjoyable, motivational and supportive was reported by 13% student comments (n=21).

- A52 *Both tutors were available and open to questions and both worked very well together and made the whole class enjoyable and educational.*
- A105 *Tutors were very nice and answered any questions I had. They tried hard to motivate students and keep the class interested (A105)*
- A107 *Both explain the content in different styles which increases the chances of myself understanding and being able to apply the content. The tutors are also really encouraging and encourage student discussion and are informal in their teaching method enabling them to be more approachable.*
- A129 *The tutors are very passionate for Human Bio, this creates a great learning environment*
- A154 *xxxx and xxxx were both informative and engaging and I very much enjoyed the course*

d) Diversity

One of the main aims of introducing co-teaching in this unit was to support interprofessional education to facilitate student exposure to skills and knowledge from different disciplines of Health Sciences for better patient care. The students' comments reflected such views wherein they experienced learning from, with and about various health professionals, both students and teachers.

Experiencing a positive impact of having two teachers in the same teaching space was reported by 12.5% of student eVALUate comments (n=20). Some of the students felt co-teaching provided them with an exposure to variety of viewpoints, opinions and perspectives to a medical situation whereas other students found it helpful because of breaking the monotony of one voice or teaching style. The following comments express opinions of students about usefulness of co-teaching in the face to face interactive workshop of this content heavy unit.

- A26 *Extremely helpful as if one tutor's explanation doesn't sink in for you than the other tutor's explanation usually does!*
- A51 *The use of two lecturers in this unit was a helpful aspect as it gives me an insight of two professional opinions instead of just one lecturer doing all the teaching.*
- A107 *Both explain the content in different styles which increases the chances of myself understanding and being able to apply the content*
- A119 *I like the co-teaching style so that when you lost interest in one teacher another could take over, or describe it in a different way*

- A120 *Co-tutoring by xxxx and xxxx is so helpful as we get to see two opinions on particular topics. One tutor might explain some topics better than the other and vice versa. So I find this really helpful*
- A141 *Dual teaching style is great, having 2 teachers allows sharing of ideas as well as the workload/questions*
- A156 *Co-teaching was a wonderful experience as students are able to benefit from the different teaching styles of both tutors*

The comment mentioned by a student (A4) summarises to some extent the variety that co-teaching brings to the classroom.

- A4 *Two tutors in my class enable two different viewpoints, opinions and perspectives on different questions, and this is helpful in this unit due to the sheer breadth of content covered in a small time period.*

e) *Student engagement*

The Australian Council for Educational Research (2010b, p.1) defines student engagement as “time and effort students devote to educationally purposeful activities” measured along five engagement scales of academic challenge, active learning, interactions, enriching educational experiences and supportive learning environment (The National Survey of Student Engagement, 2010). Although there is a behavioural, psychological, sociocultural and holistic perspective to student engagement (Kahu, 2013) which was not empirically measured during the current study, student comments reveal that they were better engaged in their learning process when their classes featured co-teaching.

About 11% of student comments (n=17) reflected a positive student engagement from their perception due to the presence of two teachers in class who use different strategies to engage with the class. The following student comments are a reflection of such opinion.

- A15 *I really enjoy when we actively engage with our tutors, and they explain processes to us. For example, xxxx explained an action potential on the board, and even though I already knew this information I was very engaged and found it effective.*
- A80 *I liked how there are two teachers during the lab as it made the class a lot more engaging.*
- A111 *xxxx and xxxx make an interesting and most importantly, very well educated and informative pair. The hands on*

approach used by both of them makes learning much more fun and engaging

A136 *The workshops were highly engaged and interesting and the way we worked through the compendiums allowed me to learn the content and revise the work in the presence of teachers.*

A159 *When the two tutors stand in front of the class and dictate content and engage with the whole of the class, I believe the learning is more effective. There is a greater opportunity to ask questions in this respect.*

f) Collaboration

Ronfeldt, Farmer, McQueen and Grissom (2015) reported that engagement in better quality collaboration demonstrated better achievement gains and vice versa. The positive and active collaboration between co-teachers as well as students and teachers was appreciated by students in their co-taught classes and reflected their positive perception of a co-taught class. Following are some of the students' comments reflective of such opinions.

A71 *I really liked the dual tutor approach. I found one of my tutors to be very engaging and the other one who was far less experienced and spoke English as a second language to provide a solid supporting role.*

A116 *xxxx has been a terrific tutor. She is gentle & fair & covers the workshop work carefully and thoroughly. xxxx is knowledgeable & clearly explains all v well.*

A138 *I find that the interaction between the tutors and the students is very good*

A148 *Having two tutors present, it allows for a well-covered explanation, particularly of difficult concepts. They aid each other in developing a good explanation that is easy to understand.*

A151 *The things that I find helpful about Human Structure and Function is that we have two teachers involved in the teaching process rather than one. Two is very helpful my tutors work very well together and they both convey the information across. As we have such a big class as well it is helpful to have two teachers walking around helping students*

The students viewed positively the collaboration between co-teachers suggesting it impacted positively on their perception and experiences of co-teaching. They also observed positive collaboration with their co-teachers during their learning journey.

5.3.2 Challenging Experiences of Co-Teaching

In response to the question about how co-teaching in HUMB1000 unit might be improved, the student comments reflecting co-teaching were selected. The students responded by either citing the challenges they encountered or providing recommendations for improving co-teaching. The two categories of comments were segregated in two clusters namely challenges and suggestions for improvement. This section reports on the analysis of challenges encountered. In total 55 students reported indifferent experiences (7.7%) with co-teaching or co-teachers from a total of 712 participants. Using grounded theory, three main themes generated were *professional behaviour*, *interpersonal skills* and *general dislike*.

a) *Professional behaviour*

Van Luijk, Smeets, Smits, Wolfhagen and Perquin (2000) developed a rating scale to assess professional behaviour in an educational setting. The key criteria established were observable behaviours associated with task performance, communication and personal performance reflecting upon the professional behaviour of teachers in a class. Each of these criteria had further sub-categories that defined the proficiency of a trained educator. Two-thirds (62%) of student comments (n=34) expressing disapproval of co-teaching cited unprofessional behaviour of co-teachers such as incompetency, lack of proper preparation and knowledge, conflicts, poor student engagement and poor discipline management as the reasons.

Most of the comments for unprofessional behaviour (n=16) mentioned one or both co-teachers of the dyad not being fully prepared and knowledgeable or trained to teach. There was disappointment conveyed by students at their co-teachers' incompetence in teaching and knowledge of content.

B10 Maybe not having co-tutoring. One of my tutors didn't seem as knowledgeable as the other and often confused me in what I had been taught

B29 I think that the co-teaching aspect of this unit is pointless and from my point of view offered no sort of extra assistance. The teaching staff had for my class did not offer a valuable and worthwhile learning experience. While the "flipped classroom" idea is a good one its absolutely pointless if you have teachers and lecturers who it seems are not competent enough to teach the unit itself and do not offer students a positive and knowledgeable learning experience

B33 How the tutors taught the unit were not very helpful to me. The teaching was not good to the point not everyone understood what was being explained or taught. I think that I could have learned more in the class with different tutors.

The students also reported that the unprofessional attitudes of some of their co-teachers did not provide them with positive learning experiences. There was disparity in the content knowledge and professional expertise of the co-tutors, creating a mismatch. It was suggestive that exposure to such behaviour might negatively impact on student learning.

B45 Tutors in the lab were not helpful ... I felt he (male tutor) had little knowledge compared to the female tutor. Their teaching methods was slightly poor, and I can see this comparison from my old tutors in this unit (1st time doing this unit). The tutors were unsure when asked questions by students at times

B49 One workshop facilitator would give vaguely incorrect answers for my questions. The other workshop facilitator was extremely difficult to understand and as far as I could see everyone 'switched off' when she started talking, as she tended to repeat herself over again on simple topic points, and smile while texting on her phone for ages when the other facilitator was talking - not professional looking. I say this here because I have no idea who my workshop facilitators are.

B51 I wasted my time every time I came to the workshops. I think there also needs a much greater scrutiny of the teaching capabilities of the lecturers. One we had xxxx was excellent, knowledgeable and good class leader, taught info, not just to pass, the other xxxx was disruptive, distracting and was unprofessional a number of times.

The next category of comments (n=9) reporting unprofessional behaviour related to a lack of student engagement in the co-taught sessions. The comments ranged from “*The tutors aren't very helpful, they don't engage the class and I feel like they don't improve my learning experience*” (B16) to “*I believe co-teaching is highly ineffective and rather confusing. The constant 'swapping' of teachers throughout a class disturbs the flow of content and lacks consistency of ideas*” (B8), citing a reason why students may fail to engage and focus on their learning in a co-taught class.

The students also perceived a lack of passion and teaching focus of their co-teachers contributing to their dislike for the co-teaching strategy.

B25 Tutors didn't encourage involvement and at times I felt dumb from their reactions to my involvement.

B34 The workshops are very boring and do not seem engaging. There appears to be very little teaching from the teachers and more of a focus on filling in the compendium.

Comments of a student (B54) represented a common theme among many students of a lack of student engagement and involvement in the active learning process.

B54 I honestly have no idea what my two lecturers names even are. They did not interact with the class at all, and made the classes very boring, where I, and many others were uneager to learn. I was unaware at many stages during the lessons of what was being said, yet we were never asked if clarification was needed. Many others in the class agreed when we had this discussion. It made going to the tutorials very time wasting.

Some students (n=8) reported conflict among co-teachers while co-teaching as another reason for the displeasure. The conflicts reported between the two co-teachers related both to content and delivery strategy. Such conflicts suggest a lack of collaboration and communication between the two partners of the dyad.

B28 Having two teachers gets confusing. One might agree with an idea whilst the other says something different

B41 The co-tutors sometimes lack communication, and occasionally give conflicting advice when answering questions

B50 I personally had issues with this unit, not because of the material, but because of the tutors. I stopped attending classes because I found that I could educate myself more effectively than I could gain from attending the classes, the cause of this being a clash between two tutors. I do not recall which tutors I had however I'm sure my class was not the only one experiencing this issue. When material was being presented the tutors would sometimes argue about how to explain a certain piece of information, which would lead to a lot of confusion.

B53 I believe that having the two tutors has been very unsuccessful for my learning as it was quite obvious that they did not get along with each other. In class they would subtly argue with each other, or disagree with what was being taught/in which way and was a high level of tension felt between them. I felt that this made the class hard to concentrate in or understand the materials properly as they did not have well planned out lessons in regards to talking to each other before hand.

Summarising the categories of this theme of unprofessional behaviour, students did not appreciate being taught by a pair of teachers who were underprepared, unprepared or untrained, lacking student engagement and involvement, or creating conflicts with each other due to lack of collaboration and communication amongst themselves.

b) Interpersonal skills

The second theme 'lack of interpersonal skills' was informed by 36% of the total student comments (n=20). Interpersonal skills are key skills required to work in a team and include verbal and non-verbal communication, collaboration, sociability, collegiality and problem solving (UNESCO, 2013). Deficiency of such skills can impact on the behaviour of others around you especially if working in a team. The students were disappointed with their co-teachers for showing poor communication and collaboration between them. They saw the teaching as disorganised due to inadequate communication and collaboration between their co-teachers.

The following comments represented students' views of their co-teachers for lack of:

Collaboration

- B4 Having two teachers is ridiculous when they don't work together. Instead one teacher talks for an hour, the other stands and listens and vice versa.*
- B48 I generally found attending class a waste of time due to our teachers inability to collaborate.*

Communication

- B21 The two tutor systems while effective some weeks, was really confusing other weeks as it sometimes felt like the two tutors had organised two separate parts of the class without talking to each other.*
- B55 I feel that the interaction between the two teachers I had wasn't very well organised. While one teacher knew what she was saying and explained well the other teacher could not do the same and often I felt lost trying to follow.*

The lack of collaboration and communication presented a very disjointed co-teaching pair leaving students perplexed about the requirement of having two teachers in the class.

The other consequence of lack of communication led to disparity of co-teachers in class. In the absence of role clarity, both would compete commanding dominance over each

other defying the basic principle of co-teaching, parity. The students clearly witnessed such behaviour and reported it in their comments (n=6).

- B5 I find that sometimes the tutors speak over each other or compete with each other in order to answer a student's question.*
- B22 xxxx i found brilliant. Her method of teaching was great, she was able to simplify things, thus making it very easy to understand. Unfortunately she always seem to have gotten the lesser section of the lecture*
- B31 The tutors don't share the work load evenly*
- B43 I do not think that co-teaching is a good idea for this class, especially when only one tutor is speaking...I wish the other tutor was given the opportunity to teach as it would have helped us as a class tremendously. On the rare occasion she did teach, she was excellent and it's a shame she couldn't teach the whole unit.*
- B52 Do not have 2 teachers in the classroom. It confuses students and appears like a competition between the two teachers. Especially when teachers override one another, and it is obvious tension is amongst them.*

The above responses support the importance of interpersonal skills in developing a congenial co-teaching interaction.

c) General dislike

Comments indicating a general dislike of co-teaching without citing any specific reason (n=7) and those comments relating to the co-teacher's accent (n=8) were grouped in this category. Twelve percent of students' comments against co-teaching strategy gave no specific reason.

- B7 Dual teaching methods get confusing at times*
- B15 Was not happy with the co teaching as it made this a bit difficult to understand*
- B46 I did find that two teachers in one class hindered my learning. This method of teaching did not go well even in my other units. I like both of my lecturers, however, a teacher should work alone in this instance as two can be full-on for students. It is like sensory overload and information overload when two of them are in class*

A strong accent of co-teachers was cited as a challenge by some students (15%). Although it is not directly related to co-teaching, it highlights an underlying challenge in

any teaching cohort that could be managed while co-teaching with support from co-teacher (see Section 7.6).

B26 One of the tutors had an accent that made it hard to understand the content. He knew what he was talking about but as a lot of the words and concepts were new to us many of us struggled to get our heads around it.

B1 I found it hard to understand one of my lab tutors due to her accent and this really affected my learning abilities in my labs

Students not only had issues with strong accents, but also the audibility of teachers' voice.

B17 However, one of my teachers is hard to hear, as not only do they only remain at the front of the room, but they speak quietly and also have an accent which just makes information in class more challenging to listen to and comprehend.

Overall, the students who did not find their co-teachers competent and professional, reported a distaste for co-teaching. However, comparing the number of dislikes (55) to likes (177), it can be deduced that overall there was a positive perception of co-teaching among the students.

5.3.3 Suggestions to Improve Co-Teaching

A total of 28 student participants made comments under this category. Further analysis of the data revealed that all the suggestions for improvement of a co-teaching strategy could be categorised under three major themes of *professional behaviour, interpersonal skill development and purposeful pairing*. Some students (n=5), presumably not having liked co-teaching, suggested smaller classes and single teacher to be the way to improve the unit delivery.

a) Professional behaviour

This thematic category of improvement of professional behaviour (Van Luijk, Smeets, Smits, Wolfhagen & Perquin, 2000) documented 54% of comments (n=14). Six students suggested that better student-teacher engagement and interaction would greatly benefit co-teaching. The lack of such behaviour defeated the purpose of having two teachers in a classroom.

C8 I feel that it would be beneficial if the teachers walked throughout the classroom when talking to the class instead of just standing at the front. My reasons for this is that my class

once had a substitute - who walked among the class when speaking. I was able to hear information better and it was more engaging

Additionally, C22 suggested that creating more engagement with students could further build a supportive environment conducive to learning.

C22 Help when you are at the stations, many times I walk away from the class without 75% of the answers to the compendium because no-one in the group knows the answer. The teachers have too many students to look after and can't get around to everyone. A more inviting environment to ask questions during the practical class, as learning is not a spectator sport

Students also reported poor performance of co-teachers to properly guide them if their co-teachers lacked appropriate preparation or knowledge about the content.

C5 I feel as though both tutors may need to brush up on the more extended knowledge of the class as I feel as though sometime they cannot answer all questions well

C6 Tutors and teachers should be fully prepared. Whenever I asked a question, I am not satisfied with the answer that is given by the teachers and tutors because they did not help me to fully understand

C21 could be improved by having teachers be more prepared for workshops

Some of the students suggested better logistics and class discipline management in the presence of two teachers to be the unit enhancement strategy.

C12 During laboratory classes, it may be useful for tutors to have a microphone, as it was hard to hear when the large class was talking

C23 Teaching staff could be more firm with students just to impose a little discipline

In summary, ensuring the professional behaviour of teachers, especially how they interacted with their students in regard to performance, communication, self-confidence, time management, knowledge and support (Van Luijk, Smeets, Smits, Wolfhagen & Perquin, 2000) would enhance co-teaching in this unit.

b) Interpersonal skills development

In addition to accruing content knowledge and professional prowess, competence in ‘soft skills’ also referred to as ‘transversal competencies’ are highly sought after skills in teachers. Interpersonal skills of communication, collaboration, collegiality, teamwork, sociability and organisation skills are one of the key components of transversal competencies (UNESCO, 2013). The students reported a lack of some of these skills in their co-teachers influencing their ability to endorse themselves as a single cohesive unit. The following comment made by C1 would provide an idea of students’ observations and impact of such situations on student learning. The interaction between this specific co-teaching pair clearly showed lack of collegiality, respect and collaboration.

C1 They need to collaborate with each other, talk about their class, how they can WORK TOGETHER. xxxx is a good teacher and she makes concepts simple so we can understand them. As English isn't xxxx first language doing this isn't so simple. xxxx needs to help him out, not roll her eyes occasionally when he's speaking or look like she's about to fall asleep

Although it is important to plan and communicate to each other, in a co-teaching pair, the contribution of each co-teacher in successful running of sessions maintaining parity and role clarity. However, the students who are not exposed to a co-teaching philosophy feel otherwise about role allocation.

C14 Also in terms of the co-teaching method, it may be more useful if (in) each lesson a particular tutor was the one presenting and the other was there to help students around the workshop

Development of interpersonal skills among co-teachers was suggested by the students for improving co-teaching interaction and effective learning.

c) Purposeful pairing

Students also conveyed that the co-teaching pair needs to be teamed up carefully to portray a positive interaction creating a better learning environment. The following comments illustrate this view:

C10 Better paired tutors who work well together

C15 Stop co-teaching unless both tutors are on the same level

- C18 *Have tutors that work well together to take workshops, sometimes it's easier to understand only one tutor which means you only understand half of the workshop*
- C26 *Maybe finding two teachers that complement each other and worked well together would improve the way this unit functioned*

Although appreciative of the teachers' support, two students mentioned issues with the accent and clarity of speech of some co-teachers.

- C2 *Our teachers are really helpful. However, if they can speak clearly in class, it will make us understand more about the topic*

In brief, the students recommended “to improve learning in class, make the quality of teaching better, make the students interested” (C25) and for acquiring such outcomes the requirement is to employ “better tutors” (C11), “...cohesive tutors” (C24) who “...need to be more passionate, more interested and more involved” (C20). The intent was very clear when C28 suggested that “I would prefer to have two proper teaching staff instead of one proper teacher, and one teacher who is still learning to teach-in such a heavy subject”.

5.4 Summary

This chapter addressed the second research question (Section 1.6) presenting the results of students' perceptions and experiences of co-teaching, using quantitative and qualitative data collected through CPES and eVALUate survey instruments. The intention was to gauge students' perceptions and experiences of the implemented and attained versions of co-teaching so as to compare it to the intended version (Van den Akker, 2003). The quantitative and some qualitative data were collected using the CPES instrument and more qualitative data were obtained from eVALUate comments submitted by students at the end of the semester.

The quantitative analysis of the data revealed that the student cohort (n=1,111) was predominantly female (72%), domestic (88%) full-time students (93%) who mainly spoke English (83%) and were in the age group of 18-20 years (60%). Most of the students (72%) were not aware of co-teaching as a pedagogical practice in HUMB1000 and a significant proportion (31%) of students were the first in their family to attend a university course. The main stakeholders in the learning process are the students, but

there was no mention of co-teaching as a delivery option in the unit outline. Hence it is important to create awareness in students about co-teaching as a teaching strategy before they engage in such learning environment.

Students' experiences while being co-taught provided an insight into the attained version of this pedagogical approach. The statistical analysis (SPSS v25) of the data suggested that the students perceived co-teaching as an effective teaching strategy with high mean scores for all five scales (3.7 to 4.2) of Teacher Support, Student Satisfaction, Teacher Collaboration, Teacher Equity and Teacher Innovation. All five scales of CPES instrument had positive associations, though students perceived Teacher Support and Teacher Collaboration more positively than Teacher Innovation. Gender differences, study load and first in family to attend university variables did not indicate any significant difference in students' perceptions and experiences of co-teaching. For age variable, students in the higher age group (above 30 years) perceived co-teaching more positively for Student Support, Teacher Collaboration and Teacher Equity than their younger counterparts (below 30 years). Domestic students perceived better equity among co-teachers than international students but conversely, international students reported enriched innovation in teaching than domestic students.

The qualitative analysis of comments collected through the three open ended survey questions (CPES) and eVALUate comments using NVivo Pro (v11) revealed similar themes. Both the data sources reported more comments for positive experiences compared to challenging experiences and very few suggestions to improve co-teaching strategy, suggesting that co-teaching is more liked strategy than disliked. Some valid minor changes as suggested by students, if implemented, would make it a very effective pedagogical practice in such large interprofessional units.

The students valued the diversity that co-teaching brings to class in terms of teachers' expertise and knowledge, better student support, interaction and engagement due to lesser student teacher ratio, observing professional behaviour of teachers such as collaboration, communication and cooperation creating a better learning environment. It also highlighted the students' appreciation of interprofessional learning by being co-taught by teachers from different fields and experiences. The students reported a few challenging co-teaching experiences when co-teachers did not get along well. The lack of professional behaviour and poor interpersonal skills among co-teachers led to conflicts of opinions, disrespect and inequity engendering a bad experience of co-teaching in students. The suggestions for improvement were mainly based on overcoming the reported challenging

experiences. The main suggestions included providing training for developing interpersonal skills, purposeful pairing of co- teachers and improved professional behaviour of respect, parity and preparedness to teach.

The data analysis of students' responses revealed that the implemented and attained versions of the co-teaching pedagogy were in line with the intended version. The main aim of introducing co-teaching was to create better learning experiences and introduce interprofessional learning. The students were cognisant of the benefits and challenges of co-teaching as experienced by them and reported these in their comments, but they also suggested modification measures in support of co-teaching. The next chapter presents the analysis of the survey and interview data collected to evaluate teachers' perceptions and experiences of co-teaching.

Chapter 6.

Co-Teachers' Perceptions and Experiences of Co-Teaching – CPES

6.1 Introduction

One of the primary aims of the present study was to determine the perceptions and experiences of those co-teachers who were using co-teaching strategy in their classrooms. The co-teaching pedagogical approach is currently employed as a content delivery approach in a core human biology undergraduate first year unit at Curtin University. Both co-teachers' and students' views were sought in this research journey to comprehend a holistic view of this service delivery model presently implemented in Health Sciences in this university.

Chapter 3 outlined the preparation and process of the current research study, stating the research objectives, research questions and data collection tools followed by analysis procedures. A detailed description of the process of development and validation of the Co-Teaching Perception and Experience Survey (CPES) in a student preliminary study was reported in Chapter 4. This instrument was used later on as a part of main data collection methods. The CPES survey instrument thus created, was used in the main study with a larger student sample (n=1,111) and co-teacher cohort (n=26) and subsequently validated as apparent by the discussion in Chapter 4. The language of the student version of the CPES was slightly modified to contextualise to the co-teacher's version (see Table 4.4). It was presumed that the factorial structure would not change with minor language alteration, since the essence of questions remained the same.

In order to gain a comprehensive view of co-teachers' perception, data were collected using the CPES instrument. The aim of conducting this survey was to collect data to address research questions 3(a, b), 4 and 5 to evaluate co-teachers' conceptual understanding of co-teaching, their experiences to point out benefits and challenges of co-teaching. Moreover, it was also intended to better understand if various demographic variables impacted co-teaching perceptions and any changes made to current version of coteaching would impact its effectiveness. The CPES instrument has three sections

to collect demographic data of the participating co-teachers and an insight into their perceptions of co-teaching (see Appendix F). This chapter reports the analysis and results of the data collected using CPES instrument to provide an evidence based interpretation of co-teachers' perceptions and experiences of co-teaching in HUMB1000 unit. The result of analysis is organised to address the outcomes of research questions 3 (a, b), 4 and 5 based on the CPES instrument. These results will also provide an insight into co-teachers' views of the perceived, implemented and attained aspects of this pedagogical approach.

6.2 Co-Teachers' Survey

As explained previously in Chapter 3 (Section 3.7.2a), the co-teachers who voluntarily participated in the study were asked to complete CPES survey instrument and give their consent to record an interview. They could opt for both data collection methods or choose whichever they preferred. Out of 28 co-teachers employed in Semester 1, 2015, 26 co-teachers filled in the survey whereas seventeen consented for interviews. There were some co-teachers who opted either for the survey or the interview, but some participated in both, the survey and the interview.

This segment (Section 6.2) presents the outcome of analysis and interpretation of data collected from 26 co-teachers' surveys. The CPES instrument consisted of three sections. The first section collected information regarding demographics (9 items) and professional development (3 items) of participating co-teachers, the second section measured co-teaching background (3 items) and perceptions (29 items) of co-teachers regarding co-teaching on a five-point Likert scale, and the third section sought responses to three open ended questions regarding co-teaching. All quantitative data collected from the survey were analysed using SPSS (v25). Manual coding and analysis were performed on textual responses to open ended questions in the survey. The coding was substantiated by two other academic researchers working in the same field and the two supervisors to maintain analytical rigour. To visualise the frequency of descriptive words used to express participating co-teachers' views, a Wordle program was used to create a word cloud.

6.2.1 Know Your Participants (Section 1)

The first section of the CPES instrument consisted of nine, 5-point Likert items and an open ended question to capture the demographics of participating co-teachers. The survey was distributed to co-teachers who had co-teaching experience in the Faculty of Health Sciences at the University. Out of 28 co-teachers surveyed, 26 co-teachers (n=26)

returned the completed survey measuring up to a response rate of 92.8%. Section 1 was analysed using SPSS (v25) software to compute frequency of a particular response to provide a comprehensive account of the demographics of the co- teachers participating in the survey.

Of the co-teachers surveyed, 77% of the participants (n=20) were females. As discussed previously in Chapter 3 (Section 3.5) the teaching team is an interprofessional team comprising co-teachers from different professional and educational backgrounds. Most of the co-teachers were employed by the School of Pharmacy and Biomedical Sciences (18), but there was a representation from other schools including School of Occupational Therapy, Social Work and Speech Pathology (4), School of Nursing, Midwifery and Para medicine (2), School of Physiotherapy and Exercise Science (1) and School of Psychology (1). Most of the participating co-teachers represented sessional co-teachers (n=20) while six participating co-teachers held a continuing position as academics at the University. Thus the cohort predominantly represented sessional female co-teachers from the School of Pharmacy and Biomedical Sciences.

Table 6.1

Frequency of academic qualification of co-teachers (n=26)

Qualification	Frequency	Percent (%)
Graduate	5	19.2
Graduate (Hons.)	4	15.4
Postgraduate	5	19.2
Doctorate	12	46.2

Of the participating co-teachers, 46% (n=12) held a doctorate qualification, five had completed a Masters or other postgraduate program, five a graduate degree and four had graduated with Honours. The co-teachers' highest level of education are summarised in Table 6.1.

Most participating co-teachers had some teaching experience, either in a secondary school or an institute of higher education. The majority of participating co-teachers (n=16, 61.5%) had less than five years of teaching experience, whereas four participating co-teachers had between five and ten years of teaching experience and only six participating co-teachers had more than ten years of experience (Figure 6.1), representing an array of teaching experience among participating co-teachers.

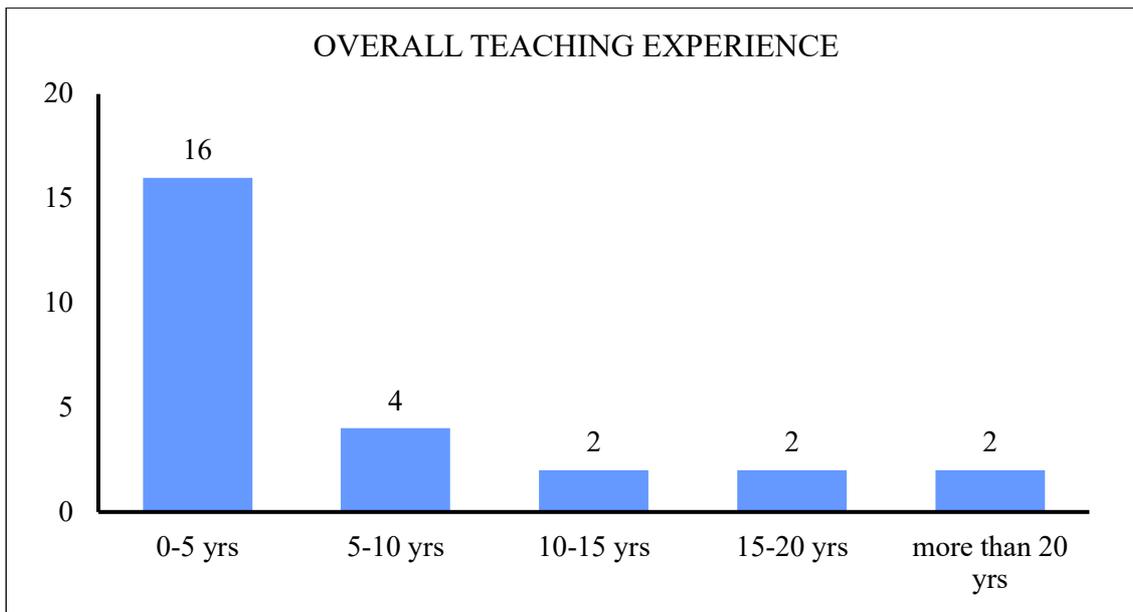


Figure 6.1 Overall teaching experience of co-teachers, by number of years (n=26)

Of their teaching experience specifically in higher education, sixteen participating co-teachers had under five years of teaching experience with four having less than a year's experience. Two co-teachers had between five and ten years of teaching experience, whereas, four had experienced teaching for more than ten years in the higher education sector. These statistics provide a snapshot of academic and professional experience of participating co-teachers, suggesting that the participating co-teachers were well qualified and experienced in their respective fields. However, the majority were new to teaching in higher education and, especially, to co-teaching.

Further investigating their involvement in co-teaching HUMB1000 revealed that there was a wide range of co-teaching experience in this particular unit. An almost similar number of co-teachers were experienced as there were novices. With regard to teaching load, most of the co-teachers preferred to teach multiple sessions per day each week for the reason that most of the participating co-teachers were sessional co-teachers. Teaching multiple sessions each week also provided the co-teachers an opportunity to interact with many other co-teachers. About 35% (n=9) of participating co-teachers had co-taught with only one particular co-teacher. Ten co-teachers had co-taught with two or three different co-teachers whereas seven co-teachers had co-taught with four or more co-teachers. This information demonstrates that the co-teaching cohort in this unit had a mix of novice and experienced co-teachers teaching together.

Table 6.2

Co-teaching experience of participating co-teachers (n=26)

Co-teaching experience in HUMB1000					
Number of semesters co-taught each week					
No. of Semesters	1	2	3	4	>4
Frequency	6	4	6	3	7
No. of sessions co-taught each week					
No. of Sessions	1	2	3	4	>4
Frequency	3	6	7	6	4
Number of different co-teachers taught with each week					
No. of Co-Teachers	1	2	3	4	>4
Frequency	9	7	3	4	3

To investigate co-teachers' understanding of the philosophy of co-teaching to conduct co-taught classes effectively, participants were asked if they had attended any professional training session/s for co-teaching. In response to this question, 61% of the responding co-teachers reacted positively. The response to the question about the effectiveness of the session/s was overwhelmingly positive reporting it/they helped to create an understanding of the co-teaching strategy.

When asked what they would prefer to learn in a future co-teaching professional development session, 88% of the participating co-teachers responded to this item. All the qualitative responses were entered onto Microsoft Excel spreadsheet for qualitative analysis. The responses were read and reread for a preliminary content analysis to get an overview, followed by coding descriptions and identification of themes (Creswell, 2012). As the data size is small, manual coding and analysis was performed. Specific words and phrases forming "text segments" (Creswell, 2012, p. 244) were accentuated using different colour highlighter pens assigning a code.

Although the data were collected as qualitative comments, it has been explained below in numeric format to establish the frequency of each descriptive word (Smith, Flowers & Larkin, 2009).

Table 6.3

Frequency of words in co-teachers' responses (n=26)

No.	Criteria	Frequency
1	Co-teaching (CT) strategies	18
2	Skills (co-teaching)	6
3	Teamwork	4
4	Concept of CT	4
5	Hands-on experience	4
6	Conflict resolution	3
7	Student engagement	3
8	Benefits (of CT)	2

On further scrutinising the list of codes, a set of themes was developed. The expectations of co-teachers to learn new skills in a co-teaching workshop were identified (see Figure 6.2) and the following emerging themes (in alphabetic order) were reported:

- Collaboration and teamwork
- Conflict resolution
- Understanding co-teaching learning environment
- Philosophy of co-teaching
- Real life experiences
- Strategies of co-teaching



Figure 6.2 Word cloud created based on frequency of descriptive words

Many respondents (69%) desired to know more about various co-teaching strategies and 23% also wanted more information about various additional skills needed to run an effective co-teaching session.

CTS 2 co-teaching skill - not teaching slide by slide but interacting & engaging together to best facilitate

CTS 20 what to do when other tutor (co-teacher) is teaching

Furthermore, 15% of participating co-teachers were also keen to understand the ‘concept of co-teaching’, its advantages and challenges, and also observe a firsthand co-taught session. Since most of the co-teachers were new to co-teaching, they wanted to see and know what an effective co-taught session looked like.

CTS 3 tutors to be put in scenarios for practicing delivered techniques

‘Building of team work’ and ‘collaboration’ was also highlighted as a vital asset to be learnt.

CTS 7 How to negotiate roles and work effectively

CTS 9 How to work together as a team to teach effectively and assist students achieve learning outcomes

‘Conflict resolution’ and learning about new ‘learning environment’ also appeared as desirable components.

CTS 1 strategies if problems arise with co-teacher

CTS 18 strategies to cope with situations arising out of differences of opinions, teaching styles

A quote from one of the participating co-teachers provided an insight into the positive impact co-teaching would have on improving content and pedagogical knowledge if co-teachers were eager to learn and held an open mind.

CTS 8 willingness to learn from co-tutors offers the opportunity to transiently develop the entire teaching cohort's skills.

From my personal experience as a co-teacher (Chapter 8) and leading a research project on training co-teachers in co-teaching, the trickle-down effect of training a few co-teachers in a cohort is exponential (Crowley, Dhar, Duncan & Wong, 2017).

6.2.2 Co-Teaching Perceptions (Section 2)

The second part of the survey focussed on co-teaching perceptions of co-teachers based on five scales. As already reported in Section 6.1, the CPES instrument used for teachers’

responses was a modified version of the students' version with slight alteration of language to suit the co-teachers' context. This section required co- teachers to record their responses to items on a five-point Likert scale (1-5) ranging from 'strongly disagree' to 'strongly agree'. There were 29 items in five scales namely Teacher Support (7), Teacher Satisfaction (5), Teacher Collaboration (5), Teacher Equity (6) and Teacher Innovation (6).

SPSS (v25) statistical analysis software was used to analyse the quantitative data collected for 29 items, five scales from Section 2 of the CPES instrument. It was tested for validation of reliability of scales, descriptive analysis and correlational analysis.

6.2.2.1 Descriptive Statistics

One of the principal aims of this research study was to determine the co-teaching perceptions and experiences of the co-teachers. To help to understand the co-teachers' perceptions of co-teaching along five scales of Teacher Support, Teacher Satisfaction, Teacher Collaboration, Teacher Equity and Teacher Innovation, descriptive analysis of the data were conducted using SPSS (v25) software. This section attempts to provide answers to research question 3 (a) by analysing co-teachers' perceptions of co-teaching along five scales. Table 6.4 reports on the means and standard deviation for all the five scales of the CPES. The mean for all the five scales ranges from 3.50 to 4.57. In general, the analysis reported very high mean scores indicating that the co-teachers perceive all five scales very favourably. Teacher Support, Teacher Collaboration and Teacher Equity are perceived positively more often than Teacher Satisfaction and Teacher Innovation.

Table 6.4

Descriptive analysis of the five scales of CPES (n=26)

No.	Scales	Items	Cronbach's α -reliability	Mean	Standard deviation
1	Teacher Support (TS)	7	0.87	4.57	0.48
2	Teacher Satisfaction (TSa)	5	0.85	3.50	0.74
3	Teacher Collaboration (TC)	5	0.78	4.34	0.51
4	Teacher Equity (TE)	6	0.90	4.28	0.71
5	Teacher Innovation (TI)	6	0.77	3.93	0.62

A mean score of 4.57 for Teacher Support suggests that the majority of teachers feel well supported by their co-teacher/s in their classes. A supportive co-teaching interaction calls for greater collaboration and hence a high mean score of Teacher Collaboration (4.34) and Teacher Equity (4.28). Co-teaching pairing of experienced with novice co-teachers, a co-teaching pair in power relation, a pair with different teaching styles, teaching philosophies or priorities might lead to a lower Teacher Satisfaction (3.50). Pre-set schedule and content for each class for consistency of content and learning activities leaves very little room for innovation.

The standard deviation for all the five scales was found in the range of 0.48 to 0.74. Standard deviation less than one suggests that there was not a great variation in co-teachers' perception of these five scales. They generally perceive co-teaching as a favourable instructional strategy feeling strongly about support, collaboration and equity among the two co-teachers. Teacher Satisfaction and Teacher Innovation are graded slightly lower compared to the other scales by the co-teachers, however, they still are perceived as positive aspects. A lower satisfaction score could be due to fact that co-teachers teach with multiple co-teachers and all of them may not meeting the expectations of their co-teaching partners. Also, the student cohort is very large and co-taught by a large number of co-teachers in different classes, and the teaching content and activities are predetermined and consistent across all sessions. In order to maintain equity among classes, there is very little room for changing the activities or adding any innovation to better engage students or suit a particular teaching style.

6.2.2.2 Inter-Scales Correlation

Inter-correlation matrixes of five scales are reported in Table 6.5. Pearson correlation was computed to analyse correlation between the five scales of the CPES instrument. Scale means were used as a unit of analysis. The analysis results illustrate an overall positive correlation between the five scales. However, it ranged from a very low and not statistically significant correlation between Teacher Satisfaction and Teacher Support (0.15) to a very high and statistically significant correlation between Teacher Equity and Teacher Support (0.70). Most of the scales were substantially inter-related except Teacher Equity and Teacher Satisfaction (0.28) and Teacher Equity and Teacher Innovation (0.37). The result of correlations is interpreted by scrutinizing the significant values for which p is less than 0.05 (Creswell, 2012).

Table 6.5

Pearson Correlation matrix of the five scales of CPES instrument (n=26)

	TS	TSa	TC	TE	TI
Teacher Support (TS)	1	.15	.40*	.70**	.41*
Teacher Satisfaction (TSa)		1	.42*	.28	.59**
Teacher Collaboration (TC)			1	.63**	.51**
Teacher Equity (TE)				1	.37
Teacher Innovation (TI)					1

* $p < 0.05$, ** $p < 0.01$

The correlation analysis suggests that if a teacher is not supported by the co-teacher in class, it leads to a poor teacher satisfaction (0.15). In the same way, inequity among co-teachers in a co-teaching situation leads to poor teacher satisfaction (0.28). On the contrary, when there is equity among co-teachers, it can lead to a very strong collaborative interaction (0.63) and support (0.70).

6.2.2.3 Association between Variables

This section attempts to answer research question 3(b) to analyse if there is any correlation between various demographic variables and the five co-teaching perception scales. The objective for further investigation was to explore if there were any differences in co-teaching perception when comparing a) gender, b) level of academic qualification, c) teaching experience, d) prior co-teaching experience in the unit, and e) attending a professional development session. A level of significance of 0.05 was adopted for the analysis.

a) Gender differences and co-teachers' perceptions of co-teaching

The data were analysed to determine any association between co-teachers' co-teaching perceptions and their gender differences. The total numbers of participating co-teachers were split into male (6) and female (20) co-teachers who had participated in the study.

Table 6.6

Descriptive statistics for gender differences and co-teachers' perceptions of co-teaching measured by the scales of CPES (n=26)

Scale	Mean		Standard Deviation		Differences	
	Male	Female	Male	Female	t	Effect Size (r)
Teacher Support (TS)	4.48	4.60	0.48	0.48	0.53	0.12
Teacher Satisfaction (TSa)	3.50	3.49	0.84	0.74	0.03	0.01
Teacher Collaboration (TC)	4.37	4.33	0.39	0.56	0.15	0.04
Teacher Equity (TE)	4.08	4.34	0.70	0.72	0.77	0.18
Teacher Innovation (TI)	4.08	3.90	0.54	0.66	0.63	0.15

An independent-samples t-test statistical procedure was performed using gender as an independent variable to examine the differences between co-teachers' perception of co-teaching in relation to gender differences. Table 6.6 demonstrates the mean, standard deviation and significance of the difference (t) between the means in two set of data in relation to variance to establish if there is a statistically significant difference in co-teachers' perception of co-teaching according to their gender.

According to the results reported in Table 6.6, significant values of all scales are greater than 0.05, so equal variance is assumed. The significant (2-tailed) values (p) are also greater than 0.05, so it can be estimated that population means are equal signifying there are no statistically significant differences between co-teachers' perception of co-teaching based on their gender. The effect sizes of all the five scales of the CPES are low (Cohen, 1992) further reinforcing that there is no significant effect of gender differences on co-teaching perception of teachers. Male and female co-teachers perceive co-teaching equally as a positive teaching strategy.

b) Academic qualifications and co-teachers' perceptions of co-teaching

The relationship between co-teachers' perceptions of co-teaching and their levels of academic qualifications were statistically analysed. Since there are more than two possibilities of academic qualification, one-way ANOVA was used with academic

qualification as an independent variable to compute the result. Table 6.7 represents the result of one-way analysis of variance (ANOVA) of each sub-group.

The higher data means (3.15 to 4.82) indicate that, irrespective of their academic qualification, the co-teachers perceive co-teaching in a positive way. However, results of the data run on SPSS (v25) also show that the means for Teacher Satisfaction are lower than the rest of four scales. Furthermore, standard deviation for co-teachers with honours show a wider spread range of response when asked about Teacher Satisfaction and Teacher Innovation. Referring to the F values generated by one-way ANOVA analysis (Table 6.7), none of the values is statistically significant ($p < 0.05$). Such results demonstrate that there is no statistically significant difference between perceptions of co-teaching among co-teachers based on their academic qualification.

Table 6.7

Descriptive statistics for academic qualification and co-teachers' perceptions of co-teaching (n=26)

Scale	Academic Qualification	N	Mean	Standard Deviation	F Value
Teacher Support	Bachelors	5	4.43	.51	.56
	Honours	4	4.82	.21	
	Masters	5	4.63	.57	
Teacher Satisfaction	Bachelors	5	4.52	.51	.37
	Honours	4	3.68	.81	
	Masters	5	3.15	1.40	
Teacher Collaboration	Bachelors	5	3.48	.80	1.42
	Honours	4	4.48	.36	
	Masters	5	4.40	.43	
Teacher Equity	Bachelors	5	4.64	.50	.35
	Honours	4	4.07	.72	
	Masters	5	4.16	.46	
Teacher Innovation	Bachelors	5	4.43	.83	.85
	Honours	4	4.10	.56	
	Masters	5	3.96	1.12	
	Bachelors	5	4.23	.38	
	Honours	4	4.23	.38	
	Masters	5	3.74	.54	

c) Teaching experience and co-teachers' perceptions of co-teaching

With a wide spread of novice to experienced co-teachers, further investigation was needed to find if general teaching experience and previous co-teaching experience had any impact on co-teaching perceptions. The data were analysed using SPSS (v25) conducting a one-way ANOVA statistical analysis procedure and the results are presented in the Table 6.8 overleaf. None of the F values for the five scales conveyed any statistical significance, hence it is assumed that previous teaching experience has no impact on co-teaching perceptions. However, teachers with 10-15 years of teaching experience reported a low mean score (2.30) for Teacher Satisfaction scale. Such a low mean score may be explained by most of the co-teachers being experienced as solo teachers with complete control over classroom management and content delivery. Sharing that space with another person might result in lower satisfaction. Higher standard deviation values were reported by teachers with 10-15 years of teaching experience in Teacher Satisfaction and Teacher Innovation scale, and in Teacher Collaboration and Teacher Equity by teachers with more than 20 years of experience. Such scores may be attributed to very low sample size representing a wide distribution of their perceptions.

Table 6.8

Correlation between teaching experience and perceptions of co-teaching (n=26)

	Previous Teaching Experience (Years)	N	Mean	Standard Deviation	F
Teacher Support	< 5	16	4.63	.46	2.19
	5-10	4	4.54	.32	
	10-15	2	5.00	.00	
	15-20	2	4.50	.71	
	>20	2	3.79	.30	
Teacher Satisfaction	< 5	16	3.51	.57	2.16
	5-10	4	4.00	.59	
	10-15	2	2.30	1.84	
	15-20	2	3.70	.14	
	>20	2	3.30	.71	
Teacher Collaboration	< 5	16	4.48	.39	1.59
	5-10	4	4.45	.68	
	10-15	2	4.00	.28	
	15-20	2	3.90	.14	
	>20	2	3.80	1.13	
Teacher Equity	< 5	16	4.40	.63	1.55
	5-10	4	4.21	.71	
	10-15	2	4.33	.47	
	15-20	2	4.50	.71	
	>20	2	3.17	1.18	
Teacher Innovation	< 5	16	4.07	.50	1.05
	5-10	4	4.08	.65	
	10-15	2	3.33	1.41	
	15-20	2	3.67	.47	
	>20	2	3.50	.94	

d) Previous co-teaching experience and co-teachers' perceptions of co-teaching

Another one-way analysis of variance (ANOVA) was conducted to identify any relationships between co-teachers' perception of co-teaching and previous co-teaching experience. The results of SPSS (v25) analysis of this data are represented in Table 6.9.

As with the previous section similar results were reported suggesting no statistical difference of co-teachers' perception of co-teaching due to previous experience as co-

teachers. Though all the scales conveyed high mean scores, Teacher Satisfaction scale reported slightly lower mean scores (3.00 to 3.70) than the other four scales.

Table 6.9

Descriptive statistics for previous co-teaching experience and co-teachers' perceptions of co-teaching (n=26)

Scales	No. of Semesters Taught	Mean	Standard Deviation	F
Teacher Support	1	4.52	.48	2.38
	2	5.00	.00	
	3	4.76	.46	
	4	4.16	.17	
	>4	4.37	.53	
Teacher Satisfaction	1	3.70	.49	.88
	2	3.70	.48	
	3	3.00	1.12	
	4	3.67	.31	
	>4	3.54	.77	
Teacher Collaboration	1	4.23	.20	1.07
	2	4.70	.48	
	3	4.13	.27	
	4	4.13	.76	
	>4	4.49	.72	
Teacher Equity	1	4.25	.52	1.03
	2	4.92	.10	
	3	4.05	.71	
	4	4.11	.84	
	>4	4.21	.93	
Teacher Innovation	1	3.85	.42	.67
	2	4.21	.50	
	3	4.11	.90	
	4	3.50	.44	
	>4	3.90	.66	

e) Professional development (PD) and co-teachers' perceptions of co-teaching

To examine the impact of attending a professional development (PD) session on co-teaching, differences in co-teachers' perceptions on the five scales of the CPES

instrument were matched to attendance of teaching staff at PD. The results reported in Table 6.10 do not show any statistically significant difference in teachers' perception of co-teaching based on attending a professional development session in any scales except Teacher Innovation. However, the Teacher Satisfaction scale in this correlation reported the lowest mean scores, suggesting lower satisfaction among co-teachers especially those who did not attend any PD sessions.

Table 6.10

Professional development and co-teachers' perceptions of co-teaching (n=26)

Scales	Mean		SD		F
	PD (n=16)	No PD (n=10)	PD (n=16)	No PD (n=10)	
Teacher Support (TS)	4.46	4.73	0.46	0.48	0.04
Teacher Satisfaction (TSa)	3.61	3.30	0.54	0.99	3.14
Teacher Collaboration (TC)	4.32	4.36	0.41	0.67	2.63
Teacher Equity (TE)	4.19	4.43	0.62	0.84	0.29
Teacher Innovation (TI)	4.14	3.63	0.53	0.66	0.68

In summary, data regarding general perceptions of co-teaching were analysed to see if there was any significant impact of chosen variables like gender, academic qualification, previous teaching or co-teaching experience and professional development on teachers' perceptions of co-teaching. There were no statistically significant relationships between these variables and co-teaching experiences except comparatively lower Teacher Satisfaction in co-teachers who had more single teacher teaching experience, lesser co-teaching experience or attended fewer professional development workshops.

These results suggest that single teacher teaching environment is different than a co-teaching environment and co-teachers need training to implement the pedagogical approach effectively. Data also revealed that co-teachers who had undergone professional development training in co-teaching, had a better understanding of co-teaching philosophy, strategies and challenges than those who had not attended such sessions.

They often used this knowledge to present the content innovatively by employing different co-teaching approaches and styles. Co-teachers also felt confident in trying new ideas and presented different views of the subject matter. These results highlight the importance of training co-teachers through regular professional development sessions to help them better interpret the philosophy of co-teaching and its application in the newly emerging learning environment of tertiary education.

6.2.3 Co-Teaching Perceptions (Section 3)

Section 3 of the CPES focussed on seeking views of co-teachers on the benefits and challenges of co-teaching based on their co-teaching experience. This section consisted of 3 open ended questions seeking participating co-teacher's opinions on what they liked about co-teaching, what they did not like and how, in their opinion, co-teaching could be improved in coming years for better student and teacher experiences. This section addresses the research questions 4 and 5 using the CPES instrument. Qualitative data analysis techniques were used to analyse the written responses to these questions. Qualitative comments would provide experienced and authentic detailed descriptions, understanding and elucidations of participant's interpretation of co-teaching (Creswell, 2012). The participating co-teachers surveyed had a firsthand experience of this pedagogy so there would be an opportunity to compare the views of various participants to consolidate a general view on further refinement, implementation and sustainability of a successful co-teaching strategy.

All responses of the 26 participating co-teachers for the three questions were entered separately into one column of a table in a Microsoft Word document. The second column was left blank for coding process. The responses to each question were reviewed several times to engage with the data and comprehend some evolving wider themes. The primary aim was to allow the data to offer explanation to the questions asked rather than to access it with predetermined conceptual categories and codes. Using grounded theory, an inductive analytical process, the transcribed data were coded following Creswell's (2012) recommendations and explored in the following way.

During preliminary analysis by reading and rereading responses of 26 participating co-teachers to the first question, 'What do you like about co-teaching?', a few ideas and themes started emerging that occurred very frequently in the text. The aim was to identify text, phrases and ideas that were similar in meaning. The responses provided by the participating co-teachers were not in complete sentence form but very specific and

precise condensed incomplete sentences like bullet points. This made coding much easier and less time consuming. An inductive open coding process was applied to code the data. Open coding facilitated the creation of codes emerging from the data that answered the research questions. Each comment was carefully evaluated to conceptualise into categories based on their similarities and associations with each other. It also enabled the identification of patterns that would generate a category or theme. The non-specific comments that were not relevant to the particular question asked were not coded, though details of such comments would be discussed during further analysis.

Using a particular coloured highlighter, a text segment was highlighted to assign a code label to it. Then using the same colour highlighter, text segments depicting comparable meaning were coded. In this way the whole data was colour coded to assign a particular code and colour to text segments with similar meanings or expressions. Exercising analytical and critical thinking skills, the codes were observed by reviewing and evaluating the comments. Similar meaning codes, repetitive words and phrases were merged into broader themes. This helped to consolidate and summarise the data into a few major themes that would address the research objectives and questions in a tangible way. Thematic categories were established by grouping interrelated open codes based on thematic content. So through the rigorous process of coding, generating categories and themes for open ended questions of the teacher survey, the data were analysed and the results were generated.

The same procedure was applied to analyse the data from the other two open ended questions of the survey. All the coded data along with the evolving themes were discussed and verified with two supervisors and a colleague who is also an educational researcher with experience in co-teaching. The objective was to reduce an incidence of missing any substantial code or theme.

The data for all three survey questions were then transferred to NVivo Pro (v11) software for further analysis. After transferring the data to the software, the comments of the participating co-teachers were categorised into different codes and themes. The aim was to conduct detailed analysis by generating queries for text search, word frequencies, concept mapping and also to map thematic codes. The following section presents the analysis of the three open ended survey questions to answer research questions 4 and 5. The analysis is organised based on responses to each survey question asked.

6.2.3.1 Positive Experiences of Co-Teaching

Twenty-five out of 26 participating co-teachers (96%) responded to the survey question related to positive aspects of co-teaching. There was an overwhelmingly positive response to this question from all respondents except one. One of the participant (CT 5) seemed to have a preference for single teacher teaching and did not like co-teaching in principle. But they also mentioned in their comments that co-teaching provided a chance to connect with other co-teachers: “*nothing really, prefer to teach alone, though like to meet co-teachers*” (CT 5).

After deeply engaging with the data by evaluating and reviewing all the comments a few times, key words and phrases were compared and organised into various categories. On further scrutiny, all the key categories were then compiled into three major themes namely a) peer learning, b) interpersonal interaction, and c) better learning environment (Figure 6.4). The percentage coding of data for specific themes regarding the survey question probing the positive aspects of co-teaching run on NVivo Pro (v11) are shown in Figure 6.3.

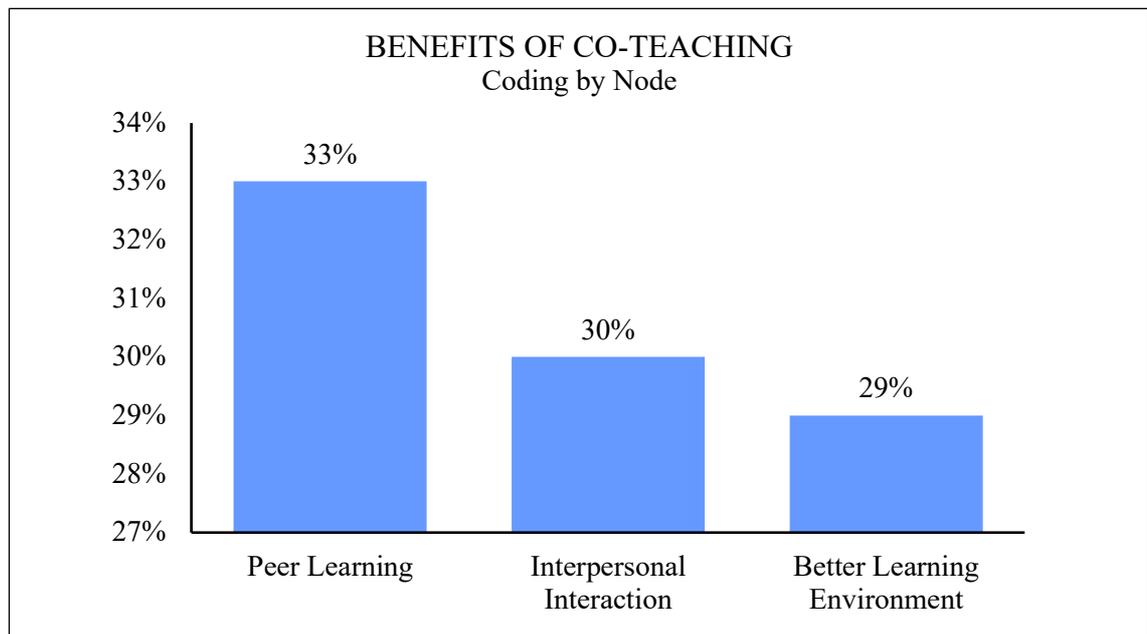


Figure 6.3 Coding results for the thematic categories illustrating benefits of co-teaching practice

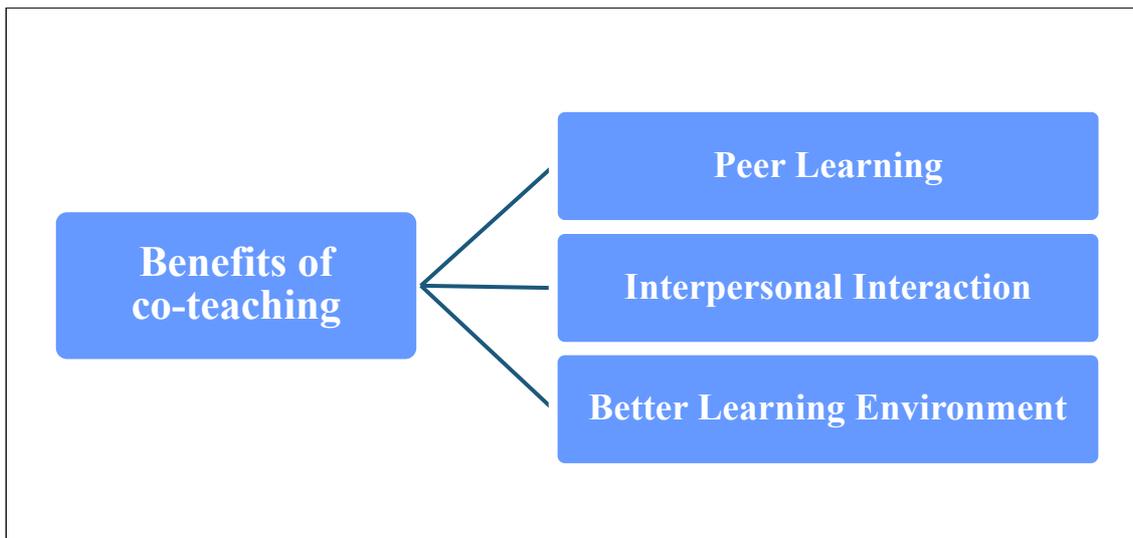


Figure 6.4 Themes for benefits of co-teaching practice

a) *Peer Learning*

The first theme of peer learning encompassed 33% of the coded data reflecting that the co-teachers considered co-teaching a great resource of learning from each other. Nineteen out of 26 participants wrote comments supporting ‘peer learning’. As defined by Boud (2001), peer learning is “...learning from and with each other in both formal and informal ways” (p 10). While scrutinising and exploring data, there was a general feeling that co-teachers were reportedly learning from and with each other inadvertently. Co-teachers certainly believed that they were “*always learning something new from co-tutor*” (CTS 6).

The respondents of the survey reported that teaching with a co-teacher provided them with an opportunity to observe different teaching styles. As the co-teachers were associated with different schools, they were exposed to different perspectives of the topic under discussion along with varying depth of content knowledge. An introduction and exposure to various co-teaching strategies was also appreciated as there was a diverse range of teaching experience among the participating co-teachers ranging from novice to very experienced.

The strength of various categories under the theme of ‘peer learning’ was determined by the numeric analysis considering how often they were mentioned in the comments. There was almost equivalent frequency of key words representing exposure and learning about various teaching styles, different perspectives, concerning experiences (6 participants for each category), new knowledge (5 participants) and teaching strategies (4 participants).

The participants' comments emphasized positive characteristics associated with co-teaching illustrated by comments such as *"two heads are better than one"* (CTS 6).

Variety in 'teaching styles', 'teaching perspectives' and 'experiences' were the strongest categories. Participants believed that co-teaching facilitates peer learning as it *"allows tutors to learn from each other"* (CTS 18).

Co-teaching not only provides co-teachers with a platform to observe multiple teachers in action but also an opportunity to learn, reflect and perform in a supportive environment. The comment of CTS 13 summarised this perception by stating that a benefit of co-teaching is *"observing approaches of other experienced teachers to reflect on my practice and try novel ideas, benefit from perspectives & anecdotes of teachers from other profession"*. The same observation resonates from another respondent's comments stating that co-teaching *"allows tutors to appreciate different teaching styles or perspectives of content, develop broader field of experience for tutors"* (CTS 15).

Participants referred to the diversity in teaching fields and backgrounds of various co-teachers adding to the richness of the co-teaching cohort and thus providing better learning opportunities. The following verbatim comments of survey participants reflected this sentiment:

- CTS 3 *learning from other's teaching experience*
- CTS 4 *opportunity to learn new & different teaching strategies*
- CTS 9 *with diff backgrounds can offer slightly different perspectives*
- CTS 16 *Share experience, knowledge, teaching methods*
- CTS 17 *learn knowledge, illustrations, teaching style from each other*

b) Interpersonal Interaction

The second strongly emerging theme representing the comments of participating co-teachers was labelled 'interpersonal interaction'. A positive interpersonal interaction cultivates collegiality. The Oxford Dictionary meaning of collegiality is "companionship and cooperation between colleagues who share responsibility". Seventeen out of 26 respondents considered collegiality as an important constructive characteristic of co-teaching, with 30% of the total comments committed to this thematic category. Many participants appreciated the individual strengths of their co-teachers and valued their contribution.

Collegiality encompasses cooperation, communication and collaboration between the colleagues leading to a progressive teamwork. During this team building exercise, co-teachers are unequivocally united to facilitate positive learning experience to students. As a result, they get to know their co-teaching partners professionally, valuing their strengths and working around their weaknesses and vice versa working towards that common goal. Such professional growth of a co-teacher involves communication, collaboration and cooperation as well as open mindedness, adaptability and flexibility.

Support of their co-teacher was regarded highly by participants. Co-teachers felt that having another person with them in a class took away a lot of anxiety and pressure. It is usually challenging for any teacher to know it all. So having another person in class sharing the teaching load took away that pressure and classes were less strenuous. They could share their teaching experiences and work around each other's strengths while improving on their weaknesses.

- CTS 1 *support of co-tutor, less intimidating, collegiality ... less exhausting by taking turns*
- CTS 7 *reduced pressure on teacher, discuss how to present & have another view.*
- CTS 9 *plan, negotiate & work around strengths of each other*
- CTS 22 *takes pressure off of tutor expected to know everything*

Another attribute that was reported positively by participants was being supported during a conflicting situation. The presence of another equally responsible, qualified and experienced person in class took away the “*fear of the unknown*”. The co-teachers felt there was a “*back up if stuck*” (CTS 17), and that it “*enables one to deal with unexpected situations while other can continue class*” (CTS 16). Being backed up and provided with support during difficulty in class situations especially if “*someone else to support with curly questions*” (CTS 24) was also valued.

Collaboration and cooperation not only during planning but also implementation of the learning material leading to a great camaraderie and team effort was also reflected in the comments.

- CTS 2 *bouncing ideas & knowledge off each other ... covering & stepping in with one another's strengths & weaknesses*
- CTS 25 *easy to bounce ideas off each other, if unsure can ask her opinion & help*

Finally, socialisation featured as another attribute for some participants as they expressed that co-teaching provided them with a chance to meet a variety of people. Co-teaching

created opportunities for co-teachers to meet people with diverse backgrounds, competencies and experiences, interacting with whom could enrich them. They could foster effective professional relationships and learn to deal with any conflicts professionally, “*good practice to deal professionally with your co-tutor*” (CTS 3).

Some of them commented that positive qualities of a co-teacher could easily rub off on their partners. “*Working with enthusiastic peers*” (CTS 7) demonstrates that co-teachers feel invigorated when they are paired with keen and passionate teaching partners. During co-taught interactive sessions, co-teachers formally or informally provide opinions about content, teaching styles and strategies, thus offering continuous feedback. Such feedback could be used by co-teachers to reflect on their teaching. Some participants reported on this aspect of collaboration by stating that co-teaching promotes “*reflective teaching*” (CTS 1) by providing “*plenty of feedback*” (CTS 19).

c) *Better learning environment*

The educational research literature is rich in studies emphasising the importance of the learning environment on cognitive and affective outcomes of students (Fraser, 2012). Dorman (2014) reported that an improved psychosocial environment in the classroom impacts positively on student learning and accountability of institution performance. Of the reported comments, 29.15% pertained to the improved learning environment due to co-teaching.

Fourteen out of 26 participating co-teachers’ responses were coded for the theme of ‘enriched learning environment’. The presence of two teachers not only made the class environment “*less intimidating*” (CTS 1) but also a “*casual environment that is less intimidating yet professional*” (CTS 8). Such an environment is “*great for students*” (CTS 18) because it demonstrates that “*good rapport creates great energy & class environment*” (CTS 2) enhancing students’ interests “*more dynamic teaching style, not boring, greater variety*” (CTS 26).

Interactive sessions by co-teachers promote more interaction and engagement with students generating better learning experiences. A participant viewed the advantage of co-teaching as “*sharing ideas/knowledge and varying content with students and co-tutor to ensure students understand subject matter*” (CTS 21), while, another participant viewed the advantage of co-teaching to be “*greater interaction & engagement with students, some degree of redundancy- if one can't explain well, the other would*’ (CTS 8).

The diversity of teaching styles and strategies creates variety to maintain student attention. The wealth of background knowledge and experience develops depth of understanding in students by engaging in discussion. The following responses of participants demonstrated the views that teaching promotes a better learning environment.

- CTS 10* *variety for students to maintain attention*
- CTS 12* *strength for better student learning experience*
- CTS 14* *good for discussion about the material*
- CTS 15* *develop broader field of experience for tutors and students*
- CTS 17* *present different illustration to clarify a difficult concept*
- CTS 22* *creates a welcoming environment increasing engagement*
- CTS 23* *very interactive for students when working with a co-tutor with team spirit*

6.2.3.2 Challenging Experiences of Co-Teaching

In response to the survey question 2, which pertained to what the co-teachers did not like about co-teaching, twenty-three out of 26 participating co-teachers (88%) provided their perspective on the survey. The other three participants, who did not react verbally, responded with a dash (-) which could be presumed that they did not have any major issues with co-teaching due to an overwhelmingly encouraging response for positive aspects of co-teaching. One of the 23 participants (CTS 22) verbally mentioned “nothing” whereas two participants (CTS 4 & 15) in addition to stating “nothing” still mentioned positive aspects of co-teaching. CTS 4 mentioned “*nothing bad as I had good co-teaching experience*”, suggesting that the strategy is not the main issue, it is the experience encountered by co-teachers that conceptualises the success or failure of this strategy. One of the participants (CTS 9) not only liked it but also recommended that it be implemented in other units.

There was only one anomalous response from CTS 5 who was clearly unhappy with co-teaching as a pedagogical approach at all. The reason for such opinion could be attributed to his/her perception of co-teaching philosophy and practice. The participant believed that a single teacher has more class control and autonomy running a class than in a co-taught class. This participant also believed that sometimes co-teachers did not meet the expectations of the other co-teacher.

- CTS 5* *I feel I do a better job on my own, have greater control on how class is presented, feel sometimes co-teachers don't do a good job.*

The responses of the other nineteen were coded and categories were generated. Upon further analysis, patterns between categories appeared and connections could be made.

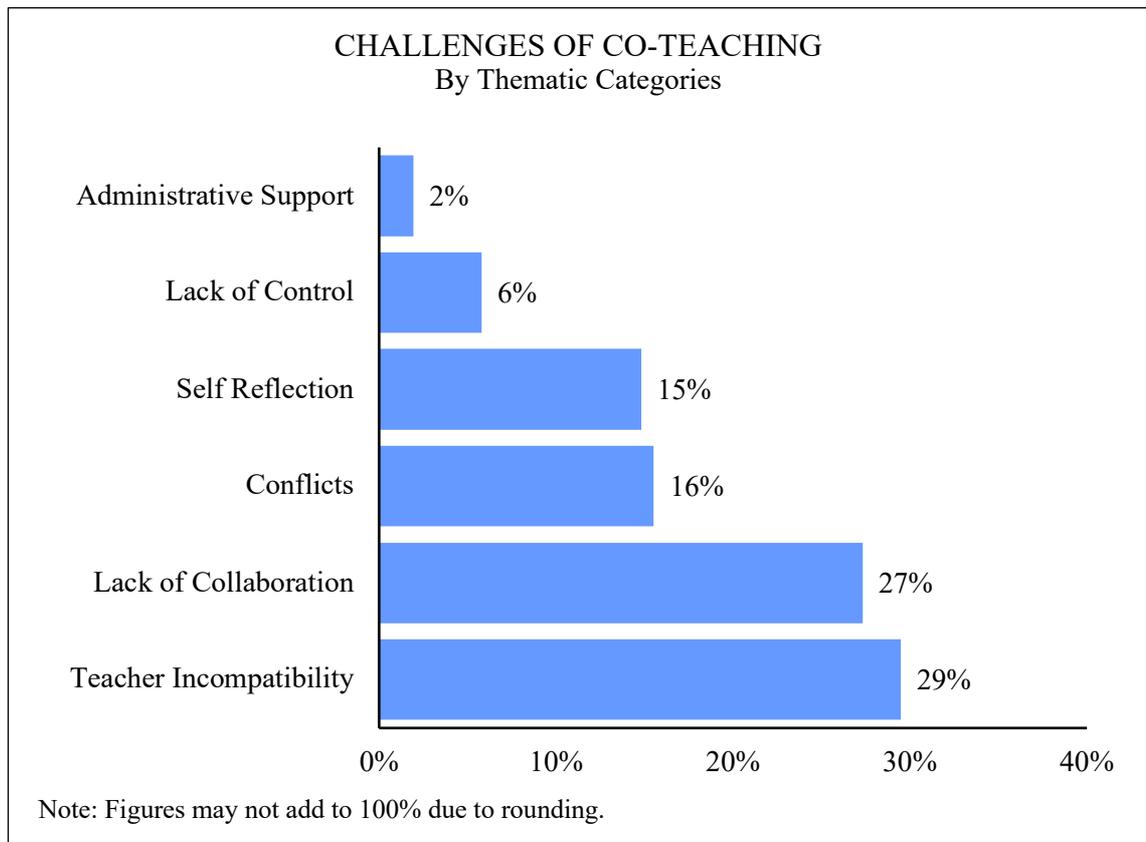


Figure 6.5 Coding results for the thematic categories illustrating challenges of co-teaching practice

Similar or interrelated categories were grouped together under specific thematic categories. This developed into two major themes for challenges to co-teaching, namely, philosophy oriented and practice oriented. The overall themes generated from the responses provided by participating co-teachers can be summarised in the following concept map (Figure 6.6), whereas, the frequency of comments representing these themes are presented in Figure 6.5.



Figure 6.6 Themes for challenges of co-teaching practice

I. *Philosophy oriented*

Very few participants expressed their displeasure about co-teaching based on the fundamental principles of co-teaching.

a) *Lack of control*

About 6% of the coded data reflected a feeling of decreased class control and administration in a co-teaching situation. Presumably, based on their previous teaching experiences as single teachers, a few participants (n=4) felt that teaching with another person could be restricting as it diminished teaching autonomy. When a class is taught with another person, there is an expectation that roles will be shared as demonstrated by respondents stating that there is “*less control over teaching style*” (CTS 1) and that it “*takes away teaching autonomy*” (CTS 12).

b) Administrative support

Very few participants stressed the lack of administrative support to organise collaborative sessions to plan and discuss fine details of a co-taught session. Considering that most of the co-teachers are sessional academics who teach multiple consecutive sessions, it is challenging to organise a common planning time. It was reported that successful co-taught sessions need to be “*well thought and timed lessons*” (CTS 12) but there is also a “*lack of paid team preparation and evaluation*” (CTS 13).

c) Self-reflection

An interesting comment reported by one participant ‘*less reflection on yourself as more emphasis on how other is teaching*’ (CTS 1) suggested that while involved in co-teaching, a person’s self-reflection is compromised. Their attention is more focussed on the teaching behaviour of their co-teacher scrutinising their content and pedagogy which takes away focus from their own reflection.

Another participant’s comment brought to light that even though they had accepted to co-teach, they had realised it was not as easy as it seemed, especially when multiple sessions were taught with different co-teachers.

CTS 15 multiple teaching sessions require flexibility that could be stressful depending on co-tutor's expectations

II. Incompatibility

Most of the responses recorded for challenges faced during co-teaching were based on the co-teacher’s own experiences while co-teaching in classes. They had encountered these challenges while implementing co-teaching during their own interactions with multiple co-teachers.

a) Incompatibility

Co-teaching involves two teachers jointly taking the responsibility of organising and running a teaching session collaboratively. So it is imperative that there should be compatibility and camaraderie between the two teachers. The main challenge that co-teachers reported was when they were paired with an incompatible co-teacher. The incompatibility reported could be of a different nature depending on different co-teaching pairs. As evident from Figure 6.5, most of the data coded (29%) related to this category. More than 60% of co-teachers reported that if paired with unprofessional co-teachers, it was an immense challenge to facilitate effective co-teaching. Even a co-teacher

who reported to be novice could anticipate conflicts if the co-teachers were not correctly matched as evident from their comment “*I am novice, can see conflicts if incorrectly matched*” (CTS 8).

One of the reasons for incompatibility reported by co-teachers was the unprofessional behaviour of their partners, wherein they either would come unprepared or underprepared to teach the whole lesson collaboratively or would not share teaching responsibility. Some co-teachers would just read off the notes and some would not even try to engage the students in their learning process. This was frustrating to the co-teachers who would prepare well and actively engage with the students in their learning. It seemed that some of them did not organise and prepare fully if they knew that there would be another person in the classroom with equivalent responsibility.

CTS 7 *unprepared or who just read notes with no insights*
CTS 18 *one was unprepared, made no attempt to engage
students & listen to their responses which was frustrating*

An insight into such behaviour came from one of the apparently novice teachers (CTS 8) who reported their hesitation to take lead or share suggestion due to lack of experience “*can be bit restricting as I am novice*”.

The other reason for incompatibility was lack of parity between the co-teaching partners. The pairing between the co-teachers is mostly random based on their availability, but generally novice teachers are paired with experienced co-teachers. Power relationships and hierarchy of teaching staff also plays an important factor. Occasionally, co-teachers, usually new ones, are paired with the unit coordinator, while some co-teachers with higher qualifications (Ph.D.) or more experience are paired with fresh graduates and sometimes, higher ranking academic staff (associate professor, senior lecturer) are paired with novice co-teachers. Although the aim is to make the novice or inexperienced co-teacher feel supported, sometimes it does not produce the anticipated effects.

CTS 26 *feel that sometimes I do less than other due to less
experience, occasionally am not confident giving ideas as
she has already taught tutorial a few times in a certain
way*

In some instances, the participants reported that their co-teachers had a dominating nature and they did not feel their opinion on how to run a session was welcome or even acknowledged. Such dominating co-teachers did not welcome their contributions or

opinions suggested when students were responding to questions during class discussions. It was more of a division of teaching work load rather than collaboration.

- CTS 10* *disagreement about the way class is run or the way things are explained, you can't repeat or interrupt*
CTS 14 *when I don't get a say how things are running*

Even when the co-teachers would plan who would lead a particular section and for how long, some of the dominating co-teachers would not stick to the plan and would try to monopolise the teaching time by “hogging teaching time” (CTS 17).

b) Collaboration and communication

The second category most commonly reported in the data (27%) was lack of communication and collaboration among co-teaching partners. The key to running a collaborative session is communication and planning of all aspects of content delivery and class management. The data suggested a lack of communication and collaboration between most of the co-teachers. The problem of communication was not only reported for preplanning the teaching session, but also during the delivery of the session. The data also conveyed that some co-teachers were not willing to interact whereas some, after confirming the delivery plan, would not stick to it, thus leaving the other co-teacher in jeopardy.

- CTS 2* *some tutors who are unwilling to be interactive and keep it fresh*
CTS 3 *agreeing on a plan & then not sticking to it*
CTS 7 *no pre planning of lesson delivery with co-teacher*

It was further difficult if the pair had an incompatible co-teacher.

- CTS 1* *challenging to discuss if u don't agree with your co-tutor*

c) Conflicts

The third most evident emergent category was the occurrence of conflicts between co-teachers. The clashes ranged from a minor difference of opinions to more serious confrontations in class. Conflicts are bound to happen if co-teachers are not compatible and do not communicate and cooperate with each other to plan to teach a session collaboratively. There were reports of personality clash (CTS 6, 26) and opinion clash (CTS 13) creating confusion among students “clash of opinions and telling students different things causing confusion” (CTS 23).

The most detrimental effect on both co-teachers' reputation and students' learning was when one of the co-teachers would correct the other abruptly in front of the whole class while in session.

CTS 16 correct or contradict other tutor

CTS 17 dominating tutors correcting new/other tutors in front of class causing embarrassment

6.2.3.3 Suggestions to Improve Co-Teaching

Twenty-two out of 26 participating co-teachers (84%) responded to this question. Based on the responses provided by these participating co-teachers to further refining and develop co-teaching practice, five thematic categories emerged based on the process of categorization. Thematic categories along with codes are displayed in Appendix I. The five emerging themes were a) professional development, b) purposeful pairing, c) collaboration and communication, d) reflection, and e) unsure.

Further analysis to visually interpret the data was conducted by generating concept map for the themes generated (Figure 6.7). The concept map designed from the data reported by the participating co-teachers represents an overview of various thematic categories and subcategories for enhancement of co-teaching in this first year undergraduate unit.

The frequency of responses representing these thematic categories are represented in Figure 6.8 overleaf.

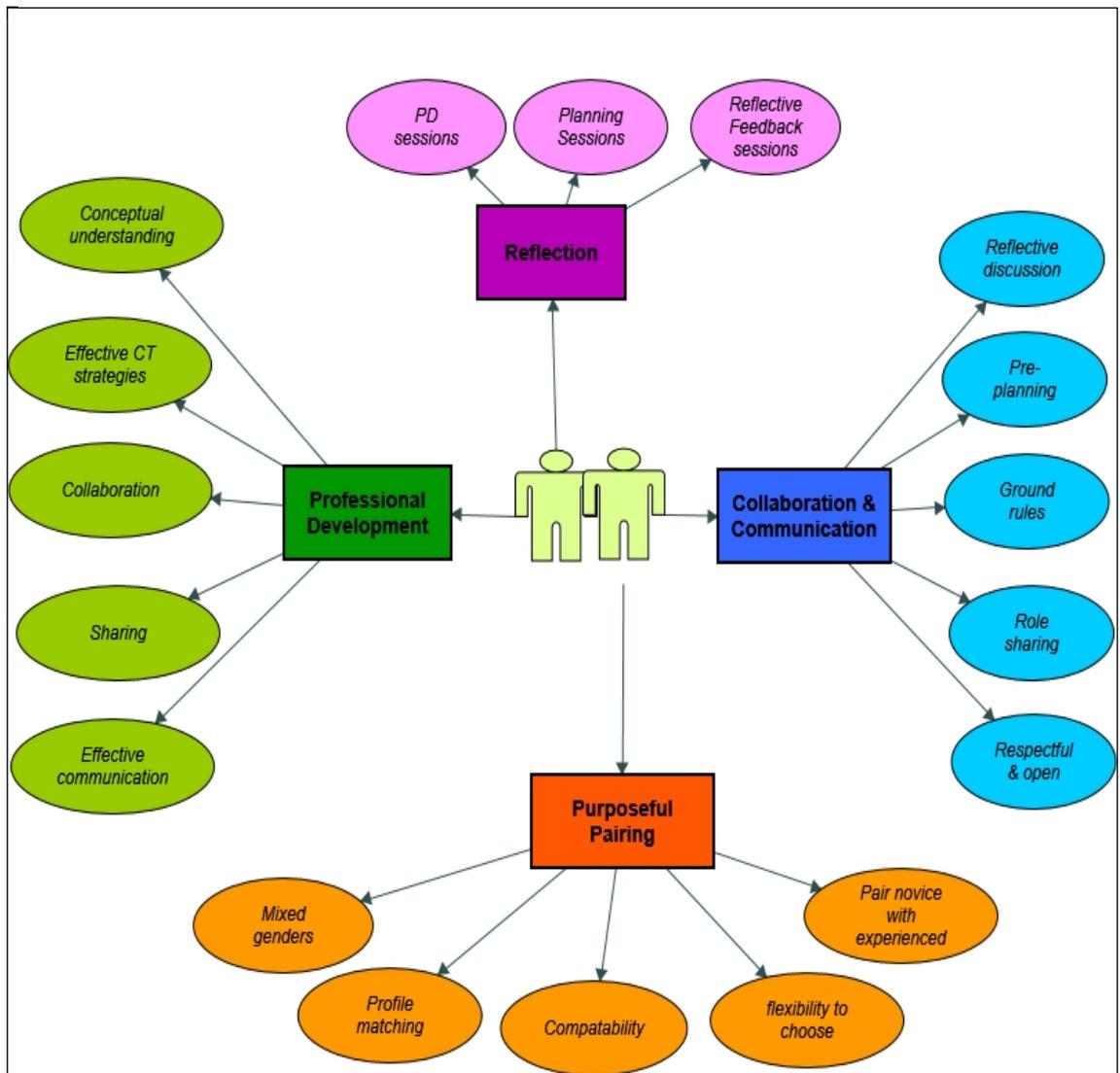


Figure 6.7 Themes for enhancement of co-teaching practice

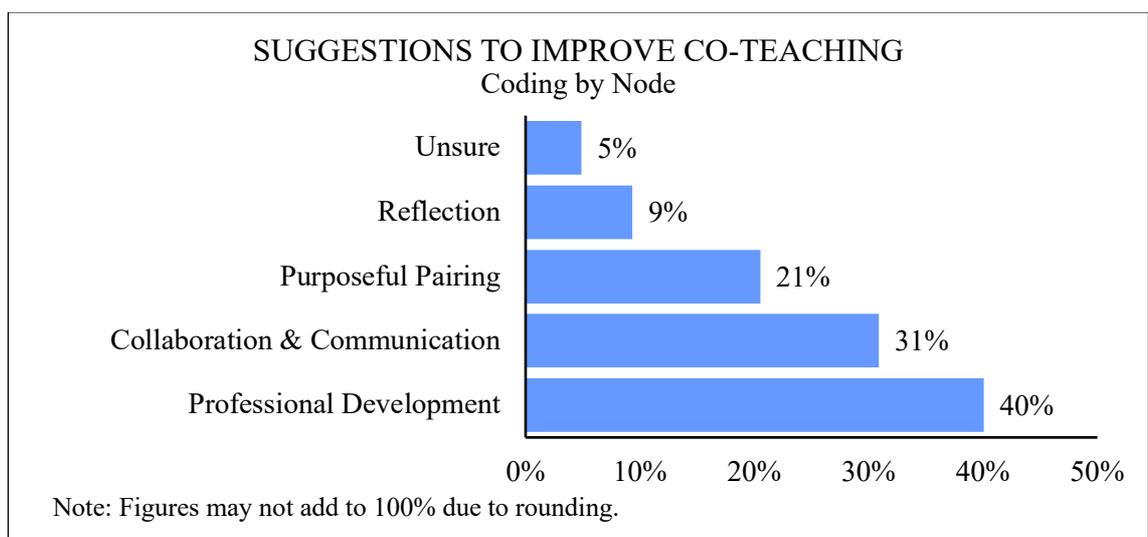


Figure 6.8 Coding results for the thematic categories for enhancement of co-teaching practices

a) Professional development

The first thematic category labelled ‘professional development’ had an overwhelming response of 40% of the total comments from the participating co-teachers. Twelve out of 22 participating co-teachers who provided feedback commented on providing training in one or other aspect of co-teaching as a contributory factor to the success of co-teaching in coming years. There was a general demand for professional development training workshops for co-teachers to enhance conceptual understanding and philosophy underpinning this delivery strategy. The successful improvement of the current co-teaching strategy will require co-teachers to be trained in the proper conceptual understanding, effective strategies, benefits and challenges of this approach to be better equipped to facilitate an effective and productive co-teaching partnership. One of the emerging themes from the data was that co-teachers did not have a clear idea of the philosophy, benefits and challenges of co-teaching. Those who understood co-teaching or had experienced it previously felt that some of their co-teaching partners did not have clear concept of co-teaching and consequently were not implementing co-teaching properly and thus felt frustrated with their partners not complying.

CTS 2 Some tutors do not understand concept of co-teaching/facilitating, it is not about delivering slide content

The co-teachers wanted a co-teaching professional development training workshop and emphasised that it should be compulsory and followed up by another workshop to support co-teachers in their training process. There was also a strong recommendation to make all these training workshops as paid sessions so there is a greater incentive for sessional staff to attend who are paid for their time on an hourly basis of engagement.

Some participating co-teachers also expressed their views on the main themes to be discussed during these training workshops. They wanted the training workshops to explain the underpinning conceptual philosophy of co-teaching and various effective strategies that could be employed for a successful co-teaching interaction between the co-teachers. It was also suggested that co-teaching could be demonstrated by modelling it in the training workshops. The demonstration of a co-taught session would also contribute to the awareness of various techniques and strategies that could be employed in different scenarios.

CTS 6 Workshops to learn strategies, techniques; demo of model of great co-teaching styles

CTS 10 More PD on how to work with a co-tutor, ideas, tools on how to run activities with 2 tutors

The other major topic that co-teachers wanted training on was ‘collaboration and communication’. Most of the teachers had experience in teaching as single teachers and were employed as sessional teachers; as a result, there was not enough comradery among them. This made communication more difficult, so they wanted to learn strategies for open communication and collaboration. As the following quotes from the survey suggest, the participants were very specific with their suggestion.

CTS 9 more PD for tutors on how to work together, negotiate
CTS 10 ideas, tools on how to run activities with 2 tutors

As most of the co-teaching cohort was sessional teachers, there was not enough time and availability of both partners at the same time to plan and discuss their roles and action plans.

b) Collaboration and communication

The second thematic category established was based on developing interpersonal skills of ‘collaboration and communication’ among peers. There was also a strong response of 31% of total comments for this category with ten out of 22 participating co-teachers (53%) emphasizing the importance of collaboration, teamwork and planning. This thematic category reflected not only on the importance of communication and collaboration to nurture a healthy co-teaching partnership but also how it could be facilitated in the current scenario.

The data revealed that the foundation of the co-teaching partnership should start early on when the pairing is organised. The co-teachers should get an opportunity to know about their co-teaching peers in staff meetings prior to start of the sessions and “*be open to new teaching styles, build relationship in staff meetings*” (CTS 17). Such interactions would lay the foundation for fostering strong co-teaching relationships. Both partners of the pair should contribute to cooperate with each other with an open mind so that they can adopt and adapt new teaching styles and strategies.

Open discussion and communication should also be conducted around setting some ground rules that are acknowledged by both partners to successfully run their sessions. Being respectful of each other’s point of view, experience and field of expertise, planning for role sharing should also be structured as experienced by CTS 7 “*a set of agreed principles of student behaviours, teaching, discipline, role marking*”.

Another respondent reported that for a positive co-teaching relationship, pre-planning is the key. In order to run an effective co-taught session, planning for sharing content delivery, responsibilities of managing class, providing support to different ability learners has to be predetermined during planning sessions. It is imperative to decide 'who is going to lead when'. The collaboration for instructional planning, effective content delivery and classroom management stimulates a constructive and valuable partnership where both partners feel equally responsible and accountable.

CTS 11 more communication between co-tutors on sharing activities, strategies for classroom behaviour management

CTS 23 pre-class agreement about how to run session

c) Purposeful pairing

The third thematic category developed was 'purposeful pairing' based on 21% of the total comments provided by the participating co-teachers. This thematic category summarized co-teacher's perception and strategies of how to develop an effective co-teaching partnership with their peer to enhance not only their contribution but also better student experiences and outcomes. Seven out of 22 participating co-teachers chose this as a possibility to enrich co-teaching experience.

One of the participants (CTS 8) suggested a strategy that adopts "*automated process to match tutor profiles that can reduce inappropriate matching*" and pair co-teachers according to their strengths.

A respondent (CTS 8) recommended pairing novice co-teachers with experienced co-teachers or the unit coordinator to build confidence and experience in co-teaching. Others emphasised the importance of compatibility between the co-teachers to develop a healthy interaction. It was also suggested that it is imperative to be familiar with your co-teacher's style and philosophy of co-teaching to foster a healthy co-teaching partnership. There was also a suggestion (CTS 17) of the need for flexibility to choose your co-teaching partner based on previous experiences. An interesting suggestion mentioned was to choose mixed gender pairs, "*making tutors aware that pairing is purposeful - more experienced paired with less experienced increasing confidence of less experienced*" (CTS 12).

Another participant emphasised the importance of continuous feedback to gradually develop a productive and dynamic co-teaching relationship between unfamiliar co-

teachers. It was suggested that while keeping an open mind and maintaining professional conduct, constructive feedback should be taken on-board to modify teaching behaviours. During the co-teaching journey, adjustments need to be made by both co-teachers forming a pair to fine tune their professional collaboration for better outcomes as evident by “*both have to adjust their teaching tone*” (CTS 3).

d) Reflection

The fourth emergent theme focussed on the role of reflection and constructive feedback to the whole cohort in general, and to each other in particular for improving a co-teaching relationship among co-teachers. The data that accounted for 9% of total co-teachers’ responses highlighted that due to lack of common planning time among majority of sessional staff, co-teachers found it hard to collectively reflect on their co-teaching experience. They recommended that paid sessions be organised “*more paid time for reflection & preparation*” (CTS 15), where co-teachers could reflect on their co-teaching practices and share their positive and challenging experiences with the rest of the cohort.

A quick revisit and reflection of the previous year’s challenging and encouraging behaviours and approaches could inform current co-teaching practices. By sharing their experiences with the rest of the cohort might motivate other co-teachers to try some new and constructive strategies in their classes.

CTS 3 regular discussion between tutors about how to improve their teaching

CTS 21 meeting at the start of year to revise team teaching strategies with all, remind them of role & responsibilities

e) Unsure

Three participants were not sure about any recommendations for enhancement of co-teaching strategies for further improvement. One of the respondents reacted “not sure” (CTS 18), whereas two respondents (CTS 12 & CTS 26) stated that they were not sure but implied that the reason for their ambivalence was that different sessions co-taught with diverse co-teachers were different and thus were unable to provide any generalised suggestion for enhancement of co-teaching practice.

CTS 12 unsure, would need to consider specific units/cohorts

CTS 26 each class is varied, no 2 co-tutors are same

On additional analysis of the data to check for graphic representation of the outcome, a query was run to find frequently used words in the comments of the participating co-teachers. A word cloud thus generated also reinforced the result discussed above. The criteria for word frequency query were to indicate word lengths of five alphabets or more to reduce incidence of commonly occurring words. The NVivo Pro (v11) software recognises 'co' of co-teaching as a separate word so for this particular analysis teaching represented in the word cloud below will be acknowledged both as teaching and co-teaching.



Figure 6.9 A word cloud generated for enhancement of co-teaching practice

There was an overwhelming representation of the words depicting the first main thematic category of professional development of co-teaching. So a need to train co-teachers professionally emerged as the most widely acknowledged requisite. The other major key words dominantly represented in the word cloud stood for the other thematic categories namely communication, compatibility and combination.

6.3 Summary

This chapter reported the analysis of teachers' perceptions and experiences while co-teaching in a Health Sciences unit (HUMB1000). The data analysed were collected from participating co-teachers (n=26) using a survey questionnaire (CPES) to respond to research question 3(a, b), 4 and 5. The data collected were both quantitative and

qualitative in nature. The quantitative data were analysed using SPSS (v25) software and qualitative using NVivo Pro (v11) software.

In response to research question 3(a), in general, the research findings indicated that co-teachers largely perceived a co-teaching strategy experience positively, but reported several challenges too. In response to research question 3(b), there were no statistically significant correlations between perceptions of co-teaching and selected variables such as age, gender, academic qualification, and teaching experience. However, co-teachers who had attended a professional development session demonstrated a higher score on the Teacher Satisfaction scale. In addressing research question 4, the findings also demonstrated that remedial actions would improve the effectiveness of co-teaching like providing professional development and interpersonal skills development workshops and purposeful pairing of the co-teachers. In response to research question 5, there were prominent findings reflecting the positive attitude towards co-teaching in the form of peer learning, interpersonal interaction, better learning environment and professional development. The challenges encountered while co-teaching effectively were mainly practice oriented such as lack of interpersonal skills, professional behaviour, parity and conflicts, rather than philosophy oriented.

Chapter 7.

Co-Teacher's Perceptions and Experiences of Co-Teaching – Interviews

7.1 Introduction

An effective approach to develop a better understanding of a research case is to employ a combination of quantitative and qualitative methods. The triangulation of data from a combination of collection methods provides a richer and detailed explanation of complexities of a case. Chapter 6 provided an analysis of co-teachers' perspectives and experiences of co-teaching using quantitative and qualitative data collected through the CPES instrument. The qualitative data were also collected in the form of semi-structured interviews to further investigate any issues to get richer and deeper understanding of co-teaching. During literature review, many research studies were scrutinized (Ballard, 2005; Brown, 2013; Gallo-Fox, 2009; Mislav, 2011; White, 2011) looking for a validated interview questionnaire suitable for the current context of the study. However, they did not conform to the objectives of this study but were a valuable resource in designing the questionnaire used in this study.

This chapter presents the result and analysis of interview data on perceptions and experiences of co-teaching from co-teachers' perspective in order to address research questions 3 (a, c), 4 and 5. Interacting with co-teachers during the semi-structured interviews provided an opportunity to gain a better understanding of their perception of the perceived, operational and experiential aspect of co-teaching strategy which could lead to a learned version to further enhance co-teaching in higher education learning environment. The intention was to see if common themes emerged from the survey and interview data.

7.2 Co-Teacher Interviews

The qualitative data collected from co-teachers were in the form of semi-structured interviews probing information through twenty-five open-ended questions. The questions were designed to gain a holistic view of co-teachers' perceptions and experiences of co-

teaching from those delivering interactive sessions in the unit HUMB1000. There were a few questions in the interview questionnaire that were not directly addressing the research questions of this study but were important to gain an overall view of the operational aspects of the human biology unit in question. Some of the questions were a reflection of survey questions intended to corroborate the findings from the co-teacher surveys.

The interviews averaged 38 minutes, mostly taking between 30-45 minutes except for two interview sessions which continued for an hour. The recordings provided by all interviewees were transcribed by me for further analysis. The quality assurance was provided by me and through member confirmation, by sending to participants a copy of the transcript for approval.

All the transcribed documents were imported into NVivo Pro (v11) for further analysis. The responses to each question provided by all interviewed co-teachers was scrutinised to look for commonalities and divergences. The data were coded into nodes to generate meaningful inferences. Later, the nodes were further analysed critically to generate significant themes. Because the entire coding process was completed independently by me using open, inductive process of coding guided by grounded theory, the inter-rater agreement scoring was not performed (Creswell, 2012). However, to endorse the accuracy and acceptability of themes, the process involved and the choice of themes was discussed with both supervisors and after consultation, confirmed.

The exploration of the qualitative data obtained from the responses of interview questions resulted in the generation of themes that were used to address the research questions 3(a, c) 4 and 5 (Sections 7.2.2, 7.2.4.2, 7.2.4.3, 7.2.4.4 & 7.2.4.5). This begins with the profile of interviewees, then perception and experiences of co-teachers along with advantages and challenges of co-teaching will be discussed, informed by the data collected through interviews.

7.2.1 The Profile of the Interviewees

All the interviewees were known to me (researcher) professionally and were teaching in HUMB1000. Among the seventeen interviewed co-teachers, two interviewees were the unit coordinator and deputy unit co-ordinator of the unit, but they also taught in the unit. To protect the identity and maintain anonymity, all the interviewees were assigned a code e.g. CTI 1, CTI 2...CTI 17. The detailed profile of the interviewed co- teachers is provided in Table 7.1.

Table 7.1

Demographic profile of the interviewees (n=17)

Co-Teacher Code	Gender	Academic Qualifications	Co-teaching HUMB1000 (Semesters)	School Affiliation	Employment status
CTI 1	Male	Ph.D.	3	Pharmacy & Biomed	Sessional
CTI 2	Female	Ph.D.	1	Pharmacy & Biomed	Tenured
CTI 3	Male	Ph.D.	4	Pharmacy & Biomed	Sessional
CTI 4	Female	Ph.D. (candidate)	1	Pharmacy & Biomed	Sessional
CTI 5	Female	Ph.D.	5	Pharmacy & Biomed	Sessional
CTI 6	Female	Masters	2	Pharmacy & Biomed	Sessional
CTI 7	Female	Ph.D.	3	Pharmacy & Biomed	Sessional
CTI 8	Female	Ph.D.	8	Pharmacy & Biomed	Tenured
CTI 9	Female	Ph.D.	8	Pharmacy & Biomed	Tenured
CTI 10	Female	Masters	1	Pharmacy & Biomed	Tenured
CTI 11	Male	Masters	6	Nursing, Midwifery & Paramedic	Tenured
CTI 12	Female	Ph.D.	8	Pharmacy & Biomed	Sessional
CTI 13	Female	Masters	5	Pharmacy & Biomed	Tenured
CTI 14	Female	Ph.D.	3	Pharmacy & Biomed	Sessional
CTI 15	Male	Bachelors	4	Pharmacy & Biomed	Tenured
CTI 16	Female	Ph.D.	5	Pharmacy & Biomed	Sessional
CTI 17	Female	Ph.D.	5	Pharmacy & Biomed	Sessional

The group included a majority of female sessional co-teachers employed by the School of Pharmacy & Biomedical sciences, who were qualified to a Ph.D. level. The co-teaching experience in this cohort was varied. There was an equal number (n=3) of first timer novice to experienced teachers who had eight semesters of co-teaching experience.

7.2.2 Teachers' Perceptions of Co-Teaching

During the teacher interviews, I tried to weave a story of the emotions and experiences that many co-teachers encounter who embark on a co-teaching journey rather than just focusing clinically on key research questions. Most of the co-teachers who have been teaching this unit since its inception were not informed that they would have to co-teach before the teaching semester started, but became aware of it in the team meeting. In the following years, as more co-teachers joined the teaching cohort, there was an awareness of this teaching strategy being implemented in large first year core units. Most of the co-teachers had no pre-conceived perception of the philosophy of a co-teaching strategy or what it entailed. The co-teachers engaged to teach the unit with mixed feelings ranging from “being excited” (CTI 5) to “not all that excited” (CTI 10) to “nervous” (CTI 15) and “apprehensive” (CTI 13).

CTI10 *Given that there was no particular direction given as to how to do it, it was for me a very hit and miss arrangement. We just did it how we thought best and that would be probably the same thing that you would be getting from others. There was no particular direction as to how to work as a team.*

CTI15 *that came as a bit of a shock and I didn't even know how we were supposed to work either. We had been provided with no training for co-facilitative co-training model. So didn't know how we were supposed to work coupling that with the initial anxiety of being inexperienced teacher, it was quite daunting idea.*

The following excerpts from the interviews illustrate the wide range of emotions associated with co-teachers' reactions when they were informed of co-teaching in the unit and also how they perceived co-teaching at that time.

CTI 1 *It was mixed, I thought it is helpful, would be easy, class can be managed and taught well. I was a little bit worried and thought might be challenging and was thinking about the co-tutor, what type of personality and how to match*

- in teaching style. You also want to be up to their teaching level.*
- CTI 12 *I was looking forward to it but was not against it. I had a pretty neutral reaction. I had never heard of it before so had no idea about it. I thought let it play out and see how it goes.*
- CTI 17 *I was interested. I went in very positively because I think team teaching is something that can work very well...I wondered how the personalities, and that I had the experience that one teacher dominated the other, would work together.*
- CTI 10 *I was not all that excited about the thought of co-teaching. Mainly because when you are experienced individual teacher, I suppose you are a bit cautious as to what the other person is going to say, how they are going to deliver it. I don't suppose I had any real pre-conceptions about it. I thought, well I got to teach this, just find out how it is done and then got into it.*
- CTI 13 *I suppose I was a bit apprehensive about it because I had never done any teaching before and then you had to go and teach with somebody else and I started off with the unit coordinator. So it was a little confronting that how it was going to go*
- CTI 15 *I was interested, kind of intrigued, because I had never done co-teaching before. At that time I quite didn't know what it was.*
- CTI 16 *I was very nervous about the idea of co-teaching, however, it was easy for me to go into co-teaching than it was for a few because I was relatively inexperienced teacher... I was worried of being as incompetent in front of another teacher. I was very concerned about my inexperience, my own perception of my own lack of competency in front of another teacher... I remember being nervous at the idea of also being intimidated and dominated by a far more experienced teacher who knew what they were doing.*

Analysis of these comments suggested that the majority of co-teachers began co-teaching without having any conceptual understanding of the pedagogical approach and taught the best way they thought they could. The data not only revealed the hidden reservations of both novice and experienced teachers but also alternate perceptions in the minds of some co-teachers.

CTI 4

I didn't have any concept of co-teaching. I was under the impression that may be there will be two groups of students with one leading one group and other the second group. I did not realise it was one to one thing. I had no preconceived idea of what co-teaching is.

To dig deeper and establish why co-teaching was chosen as the pedagogical approach for this unit, data analysis further confirmed that most of the participants were unaware of the reason. None of them had a definitive idea but speculated it would have been logistically driven. Most of the participants (n=14) believed that the key factors to implement co-teaching strategy would have been the large number of student enrolments in this core unit and maintaining a reasonable student-teacher ratio. Only three participants suggested interprofessional education might be one of the reasons for selecting co-teaching as the pedagogical approach in addition to maintaining the student-teacher ratio.

CTI 8

I am not entirely sure as how it was decided when the unit was created because I was not around at that time. But I assume it was something to do with the numbers in the unit. And we needed to run large classes, which would require two tutors, plus it was also a part of their interprofessional first year. So the aim was to have tutors from different health backgrounds so that they could give students perspectives on different things in their classes

While there is a lack of clarity on what exact reasons were cited to introduce co-teaching in this unit, there was a unanimous view that it enhanced teaching and student learning both logistically and educationally. Even though the only participant who did not prefer co-teaching believed that co-teaching provides students with better learning experiences.

Most of the respondents (n=12) reported that they had not received any professional training to co-teach before starting to teach collaboratively in this unit. Some respondents (n=5) had attended a generic teaching and learning workshop where co-teaching strategy was introduced but they believed that it was of not much help to understand its philosophy, models and fine nuances.

CTI 11

Through the foundations of learning and teaching modules, it may have been mentioned briefly. But there were never any detailed instructions about co-tutoring. Initially there was some information about co-tutoring in second semester (2011) but it was very generic and theory based.

CTI 15 *Yes, largely impractical because mostly emphasis was on pre planning and consolidation at the end and discussion and reflection...but that is not really co-teaching model. I think they were just as clueless as we were on co-teaching. Though they did their best, I don't feel that I learnt much. It was not practical stuff.*

In general, the comments of the interviewed co-teachers revealed that they perceived co-teaching to involve two teachers who would support each other's teaching. During such collaborative teaching, it was also perceived that co-teachers would support each other by sharing knowledge, skills, opinions and expertise. The interactive association of co-teachers was expected to bring variety for increased student engagement and better student outcomes. The preconceived perceptions of co-teaching are presented in Figure 7.1.

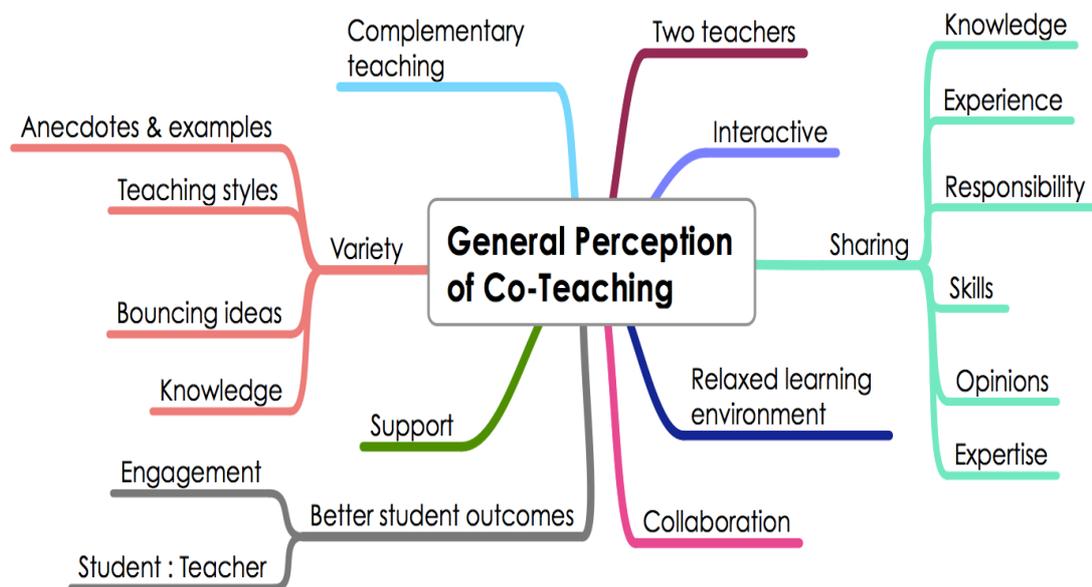


Figure 7.1 An overview of preconceived notions of co-teaching by co-teachers

As the co-teaching progressed and co-teachers started teaching as dyads, the approach required interaction and collaboration. Investigation of comments of the participants regarding their understanding of co-teaching revealed an assortment of perceptions ranging from “vague” (CTI 10) to very well-established view. All the respondents anticipated that there would be two teachers in class who would be expected to collaborate and share class teaching, but the idea of how to share teaching was not cohesive. The teacher comments were categorised into three themes, namely: a) You teach, I teach, b) Shared partnership, and c) Synergy.

a) *Perception 1: 'You teach, I teach'*

Some of the participants (n=4) perceived co-teaching as a strategy where there are two teachers in class who share the teaching load and provide support when needed or to fill in the gaps. They would not feel accountable to take full responsibility for the whole session.

One of the respondents (CTI 10), who is a very experienced teacher, started to co-teach having no clear idea of co-teaching. She reported that she would roughly split the total teaching load in half and teach her part while the other teacher would teach the other part. The only collaboration was an agreement on the division of work load.

CTI 10 To deliver the bit of content I am responsible for I suppose and then the other tutor is delivering their content...I just looked at the two hours work and decided what half is practically roughly, so I picked the ones I want to do and if they wanted to change it, they were welcome to change to...But I would particularly concentrate on the bit I was giving.

Another respondent (CTI 4), who was a novice teacher, appreciated co-teaching because it helped students and teachers to learn and grow but also shared a view not conducive to co-teaching.

CTI 4 It is 50-50 kind of a thing...It is very helpful in terms of that you don't have to take entire responsibility on yourself.

b) *Perception 2: 'Shared partnership'*

Most of the co-teachers (n=8) perceived co-teaching as a teaching method where two teachers collaborate and share the responsibility of delivering the learning material cooperatively. The roles are designated based on individual strengths and weaknesses, or, preferences of the dyad where one takes the lead role and the other supports in different ways. Some of the comments that reflect these opinions are as follows:

CTI 7 I understand it to be a sharing of teaching responsibility, sharing, imparting of knowledge, helping the students not just giving out the knowledge ... It is basically a joint process but keeping our own styles of teaching.

CTI 14 They share the responsibility. Usually one takes the lead at certain parts and the other one either helps out or observes and they kind of share their duties equally.

CTI 16 2 tutors teach, depending on activity, turn taking or spontaneous additions, one leads one assists, back up.

Nevertheless, the perception appeared to conform to some of the co-teaching models like 'one teach, one observe' and 'one teach, one assist' (Friend, 2008), but there seemed to be a lack of ownership for the whole session by the dyad. Both the partners would feel accountable only for their part played. The participants claimed that sharing the teaching load would increase variety and student involvement, yet they would not see each other as equals and work symbiotically.

c) Perception 3: 'Synergy'

The perception of co-teaching of some of the co-teachers (n=5) was in agreement with a refined view of co-teaching found in the literature. Their comments implied that their co-teaching not only involved sharing of teaching but also collaboration and communication to integrate their experiences, expertise and skills for better student learning outcomes. The focus was on creating a synergistic effect by 'bouncing ideas off each other and bringing two people's different skills in teaching to table' (CTI 3). The following excerpts of comments from two participants provide the real essence of co-teaching.

CTI 5 a new teaching method really useful where two teachers collaborate with each other. Both of them come prepared for the lesson but because usually they come from different background, they can have different point of view and opinions. The important thing is that the two tutors interact with each other for the benefit of students... If you have this feeling, you can work well and students also feel the good communication and interaction between the tutors.

CTI 6 Co teaching involves two teachers drawing upon the expertise of two professionals in a collegiate environment who collaborate with each other and engage students in learning. They are both responsible for delivering the same content that the unit requires. One teacher may lead the lecture or tutorials, while the other assist or contribute in the discussion, without detracting from the other and they can swap roles, preferably on pre-arranged topics.

An additional view was given by the unit coordinator (UC) and the deputy unit coordinator (DUC). They both agreed that in addition to normal collaborative teaching, co-teaching provided them with another opportunity to fulfil their role and responsibility as

managers of the unit. It allowed them to mentor and train new and inexperienced co-teachers by pairing with them in various classes.

CTI 8 (UC) I think it is slightly different for me as a UC ... We do play a training role as well and put new tutors with us as much as we can.

CTI 9 (DUC) In the first few weeks with the new co-tutor I would take on more till he got comfortable and then we just kind of divided things up because he was quite confident and fine'

In spite of having different perceptions of co-teaching, none of the respondents were entirely dissatisfied with their co-teaching experience. Some of the respondents (n=5) recounted having mixed feelings due to teaching multiple sessions with different co-teachers over a few semesters. They reported their experiences as mainly positive but also reported some challenging experiences due to different personalities, unfamiliarity and lack of communication with their co-teaching partner.

Before addressing research question 5, I wanted to find out if co-teachers thought co-teaching was an effective pedagogical practice. The data revealed that there was a largely positive response from all except two co-teachers (unit coordinator and deputy unit coordinator). Both of them believed that co-teaching was a realistic solution to cater to large student numbers in an interprofessional learning environment, but they were unsure if co-teaching was more effective than single-teacher teaching based on the students' academic outcome. Almost all the respondents (n=16) believed that the variety exhibited by co-teachers with respect to skills, experiences, teaching perspectives and styles would positively impact on student learning and interaction in class.

CTI 3 I think it is effective...having two different voices in the room draws attention back. I think it also is effective because it also increases the knowledge of the class that can be shared; it has potential to bring two different teaching styles together which might improve student responses.

CTI 9 I don't know if students learn differently by having two tutors. I mean we get responses like most students like it and they value the different ways to explain things and different views and lived experiences. I think it is effective from that perspective.

Preference for either single teacher teaching or co-teaching was also investigated. Only two co-teachers had a strong affiliation to single teacher teaching. It was interesting to find

that both of these respondents had extensive experience of single teacher teaching in a higher education setting. They preferred single teacher teaching because it offered more autonomy and class control. On the other hand, the rest of the respondents either preferred co-teaching or were neutral in their preference.

- CTI 2 I don't have any preference and I don't mind either. There are advantages and disadvantages in both. I enjoy doing co-teaching but I also like single teaching.*
- CTI 7 To be honest I prefer co-teaching. The reason is that I do enjoy working with somebody else. I do like having two different personalities of teachers in one classroom. I actually think that when it works, it works really well, when it does not work, it can be resolved to be improved...I actually think co-teaching is fun.*
- CTI 11 There is no division of activities if you have a well-developed relationship with the co-tutor. It is less demanding. Whereas single tutoring, it is more demanding but you have more autonomy and responsibility in terms of the delivery and lesson plan*
- CTI 14 I enjoy aspects of both. So I enjoy having that kind of support with co-teaching but I do enjoy the autonomy of teaching on my own being able to direct the class on my own ... But that is not necessarily the limitation of co-teaching*

The respondents suggested that both strategies had their advantages and disadvantages, but their inclination, nevertheless, would be towards co-teaching because the benefits outweighed the challenges.

- CTI 1 I prefer single teacher. May be because I would get more freedom. But I don't know if I have to handle it single handed and find it difficult I might prefer to come back to co-teaching. Who knows?*

From the teacher interviews it was apparent that co-teachers had established their own perception of co-teaching in the absence of any formal co-teaching training. Although they understood the teacher independence and class control single teacher teaching offered, preference was for co-teaching due to its potential for personal and professional growth. Some of these respondents (n=5) later attended co-teaching workshops organised by me to create awareness of the philosophy and models of co-teaching based on my preliminary data collection, and this was appreciated by the co-teachers.

7.2.3 Co-Teaching Models Implemented

This section reports the result of the findings enquiring about the models of co-teaching currently implemented in the unit. It was important for me as a researcher and co-teacher to understand which co-teaching models are implemented in different classes, and the rationale supporting them. To respond to this question, the participants were provided with a reference table of various co-teaching models (Friend & Cook, 2007) supported by a brief introduction of each model by me. The six models are: one teach, one observe; one teach, one assist; parallel teaching; station teaching; alternative teaching; and teaming.

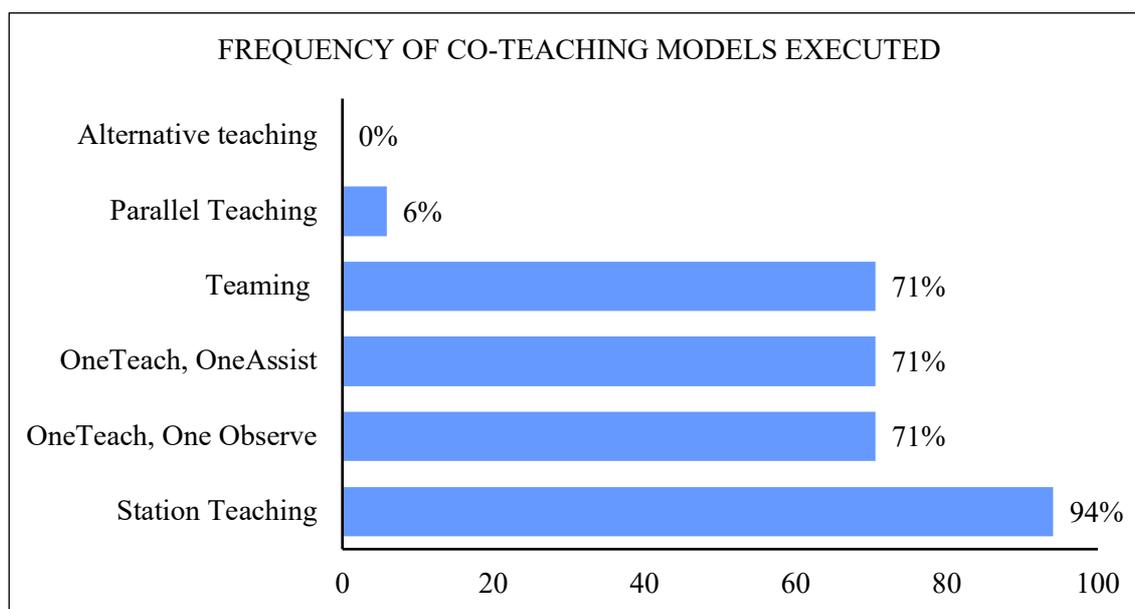


Figure 7.2 Frequency of various co-teaching models executed

The results reported that none of the respondents used a specific model. They all used a combination of these models. Hence the data represents the frequency of use of any one co-teaching strategy by a co-teacher. As indicated by Figure 7.2, station teaching was preferred by most of the respondents (94%) whereas, parallel teaching was least preferred (6%). There was an equal frequency of one teach, one assist; teaming; and one teach, one observe (71%). None of the respondents reported using alternative teaching, whereas, all except one respondent (CTI 16) used station teaching model. Two respondents (CTI 3 and CTI 14) reported using parallel teaching once but were no longer using it due to i) change in class activity and ii) the class management challenge it offered. It was observed that running a class of almost 50 students made it difficult to manage running two parallel sessions simultaneously as it created noise and confusion.

- CTI 1 *parallel teaching, not this one, because I think that it would create a lot of disturbance in a room. I think I did it once but it was very noisy.*
- CTI 3 *there is one in particular where we used parallel teaching (compendium 1 prev. sem.) where we had to talk about introduction to wet lab in one lab and living and dead in another lab.*
- CTI 9 *In our class settings it would be ridiculous for both to teach together.'*

To promote active learning, the structure of the teaching session is organised in such a way that the material for learning activities like models, specimens, Anatomage Table (simulated anatomy resource), fresh animal tissue and laminated diagrams are placed on six different stations, with each station focussing on a different learning outcome. The students move around these stations in a timely manner to complete questions or activities based on those concepts. All except one respondent reported using station teaching during their sessions based on the design and learning outcomes of a particular session. It was also reported that while station teaching, both co-teachers would float around the classroom engaging with students, addressing their queries and supporting their learning needs.

- CTI 13 *when we move into the stations, then station teaching*
- CTI 14 *When we have stations, we use station teaching and we float around. Then may be if students have questions, then you engage with that group*

However, one respondent reported that an inadequate amount of time is spent on each station and there is inequity in knowledge sharing by co-teachers with all students as there is not enough time for learners to focus on a particular station.

- CTI 15 *move on to station teaching. This can work well if you have got enough time, but time is very limited in HSF (HUMB1000). I feel it is getting more limited in stations.*

Another respondent mentioned on a different issue encountered during station teaching. If there are two major stations where students need support, for instance, the Anatomage Table and fresh animal tissue demonstration, there is not enough support for students on the rest of the stations. It becomes challenging for co-teachers to accommodate to students' learning needs.

CTI 10 Station teaching is used when we work on stations like I would be around stations and the other would be around anatamage

Of the other three co-teaching models (one teach, one observe; one teach, one assist; and teaming), all the co-teachers reported using a blend of these models guided by the learning activities. Most of the co-teachers admitted using a combination of them and preferred one over the other depending on the activities required “*We use a range depending on what we are doing*” (CTI 9). However, most of them (n=9) used ‘one teach, one assist’ as the predominant co-teaching style followed by ‘teaming’ (n=8) and finally ‘one teach, one observe (n=7).

Interestingly CTI 10 reported that due to unfamiliarity with some teaching techniques, they did not use them.

CTI 10 I don't use one teach one assist, haven't used alternate teaching and haven't used parallel teaching either. I am not opposed to those styles but I have not used them probably because I haven't had much training on these levels of teaching.

A lack of understanding of the philosophy of various co-teaching models was also highlighted by CTI 15 as a factor impacting on the co-teaching models used by various co-teachers.

CTI 15 In first couple of sem. there was a lot of one teach, one observe because no one was used to co-tutoring and everyone delivered the teaching styles as they would normally, as though they were the only teacher. So there would be one tutor not really engaging for about half of the semester

The impact of lack of training echoed from the response of CTI 2 when they admitted that “we do not use one teach, one assist though it would be interesting to see it in action and be explained how it is done”.

The other factor that dictated the use of a specific model was the personality of the co-teacher. If one of the dyad is an experienced co-teacher and the other is a novice, then the experienced takes a mentoring role defining the model to be implemented. As CTI 8 commented while teaching with a novice “...as I mentioned before with Brian (pseudonym) in the beginning, more of a one teach one assist or observe, though he would be assisting and involved when he wanted to be”. When you are familiar with your co-

teacher or have co-taught with them, the camaraderie improves and innovative strategies can be implemented as evident from the comment of CTI 10 “Bouncing off ideas can be done only when you develop some sort of familiarity. You get a little bit better with it as you work together”.

These findings suggest that there is not any ‘one fit for all’ model. An appropriate model of co-teaching was preferred depending on the learning activity and co-teaching partner. In the case of a familiar co-teaching partner, teaming would be preferred, whereas, less familiar co-teachers would prefer one teach, one observe or one teach, one assist. During station work, station teaching was implemented.

7.2.4 Experiences of Co-Teaching

In order to envision all aspects of the co-teaching experience of teachers, firstly, their role and identity as a co-teacher, their expectations from their co-teachers or how they allocated roles needed to be explored. Secondly, the benefits and challenges encountered during their co-teaching journey should be investigated. Finally, the impact of these interactions on their own teaching praxis should be probed. The following sub-sections report responses to questions addressing various aspects of co-teaching experience of teachers.

7.2.4.1 In Preparation to Co-Teach

In response to interview questions (see Appendix H) enquiring about their role as a co-teacher and the expectations from their co-teaching partners, most of the respondents (n=15) strongly believed that their role as a co-teacher was to be prepared for the whole content and communicate and collaborate with their co-teacher to deliver content cooperatively facilitating student learning. In this partnership, there was an equitable sharing of learning activities, requiring the co-teachers to dispense their role effectively. Most of them envisaged their role as ‘one teach, one assist’.

CTI 11 I think my role as a co-tutor is to be an effective teacher; to provide a quality teaching and learning experience for the students whilst maintaining that co-tutoring relationship. I think it is interplay of maintaining an effective relationship with the co-tutor, delivering the learning materials and assisting the students in achieving the learning outcomes.

CTI 13 Each tutor needs to be comfortable to present at least half of the material within the two-hour workshop, and when one tutor is delivering the material, they are there to

support them, help to answer any questions that might come up, add anything that they may have missed.

One of the respondents (CTI 17) saw her role as a mentor due to her vast experience in teaching (although had more experience of solo teaching/lab demonstration with multiple teachers). Another respondent (CTI 15) visualised their role not only to provide support but also to bring his own experiences to the session.

CTI 15 I think that is how I see my role as a co-tutor, first and foremost bring different perspective, different learning and teaching style. We all have our anecdotes that we can bring to the table. You are continuously swapping between a supporting role and a leading role.

The expectations from their co-teachers were categorised into themes represented in Figure 7.3.

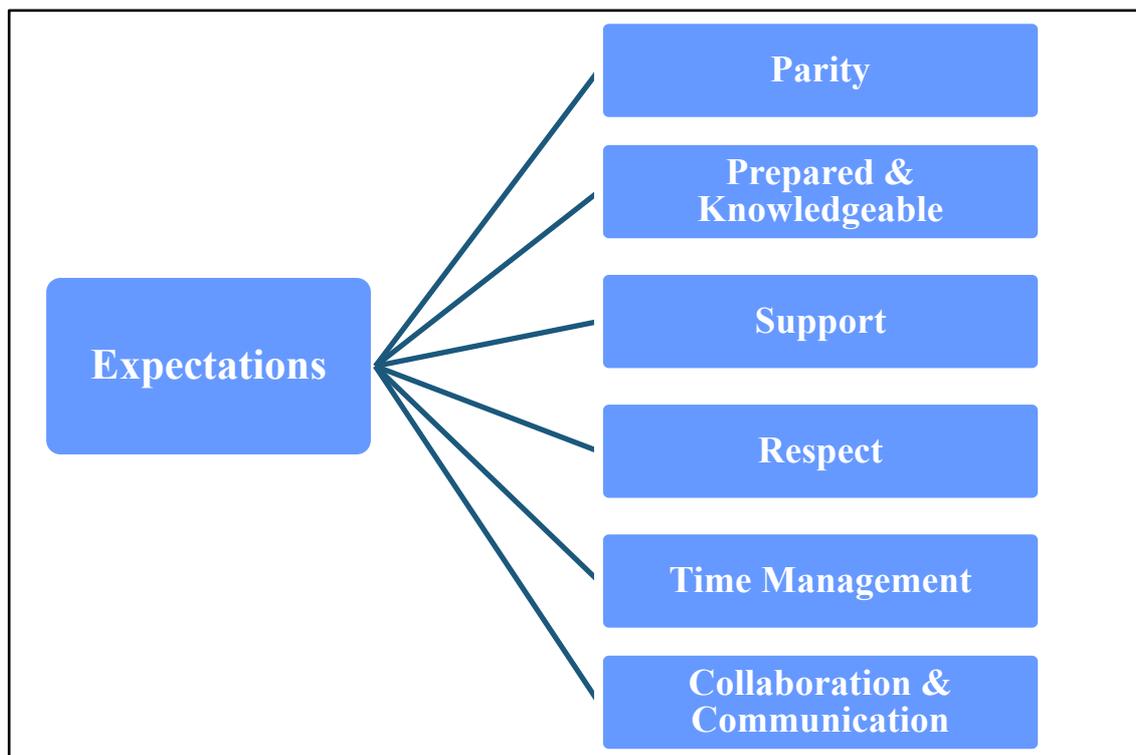


Figure 7.3 Thematic categories for expectations from co-teaching partners

Further probing their expectations from other co-teachers revealed that highest on the list was ‘parity’ with 65% (n=11) of the respondents expecting their co-teachers to be open to cooperation and collaboration to execute the session sharing the roles equally. There should be a fair and reasonable distribution of workload albeit respecting a preference for teaching a particular segment of the session or adding comments for better student learning experiences.

- CTI 1 *We can talk about how to distribute tasks and agreeing on which parts each one of us is taking. Also not feeling dissatisfied with what other has done. Ask my opinion on how the class needs to be run and not ignoring and have equal opportunity for each of us to run class*
- CTI 10 *Hopefully they won't take an offence if I add something, if I feel at some step that I want to add something that I feel might help students*

Following on this list was 'being prepared and knowledgeable'. 58% (n=10) suggested that they expected their co-teacher to have sound content knowledge and be well prepared to deliver the whole two-hour content and also bring their own experiences and anecdotes to share.

- CTI 8 *I expect that they would rock up just as prepared to teach as much as I am. That's what I expect. I think that also happens.*
- CTI 12 *I guess the expectation from my co-tutor is that they read the material and they know what is in the sheets. They have looked and thought about what is to be presented before they come to the class*

Subsequently, 'support' (41%), 'respect' (35%) and 'time management' (29%) were other key expectations of respondents from their co-teachers to maintain a professional, harmonious and synergistic learning environment in class beneficial both to the students and co-teachers.

- CTI 10 *They would have a sense of timing. Objectively, we were given rough timing allocations. Sometimes you go over, sometimes under, generally you go over. I found that tricky. The first one I did, trying to catch the attention of the other tutor to say...timing...Your co-tutor can monitor time because it is difficult when you are explaining to monitor time as well*
- CTI 12 *If I am teaching, I expect my co-tutor to be looking for things that need to be done, to pick out key points and monitor what I am doing and if I have missed something, to ensure that it is covered and also to go around when the students are working in groups and monitor their learning progress.*
- CTI 13 *add any material that I might have missed or if they have got anything interesting to add about the topic. I am always happy for them to jump in and add a bit more to make it a little bit more interesting to students*

A noticeable comment made by one of the respondents (CTI 1) resonated well with the essence of co-teaching.

CTI 1 My expectations are always high. First we are welcoming and accepting each other. There are three factors if they are well established, things will go fine. Communication, collaboration and cooperation are those three factors, especially with communications. Sometimes if you do not communicate well, interpret the actions or words wrongly, it becomes an issue. We can talk about how to distribute tasks and agreeing on which parts each one of us is taking. Also not feeling dissatisfied with what other has done

Communication and collaboration were other key expectations of teachers from their co-teaching partners. The lack of common planning time was felt by all the participants. As most of the teaching staff were sessional academics, they found it difficult to find a common time to meet and plan the session. Insufficient planning would have an impact on their role allocation which could influence smooth running of the session. Some of the participants tried to communicate electronically, but that did not seem to work out effectively.

CTI12 I tried to send emails to ask what they were going to do. Some tutors have actually objected to that and don't feel that they need anything of that sort. It generally comes down to five minutes before the class. Even if we have started email negotiations, it falls through. I email but nothing comes back.

The co-teachers predominantly decided on division of their responsibilities and roles a few minutes prior to the session, usually as the students were settling in. When asked how they would negotiate and plan the division of responsibility of teaching between the two, the overwhelming response was “on the go”.

CTI 2 We don't plan but come together before the class, 5-10 min before class and discuss who is going to take which activity. Sometimes it just evolves by itself. Most of the times with my co-tutors, we do not mind which activities we take or have preference because we all come prepared for the whole class.

CTI 15 ...with great difficulty. I try to come prepared with an idea of how I would present a particular activity and so does the other person...The planning time from my

experience is the two minutes before the class. Like I feel more confident with this or that, do you want to do this or that, generally speaking, we do not mind ... But that is my experience, planning tends to be quite ad hoc ... It is easy as contractual staff to say that it is okay to meet for half an hour before and after because we are paid, but as a sessional staff I don't believe that it is fair to work unpaid.

The results so far suggested that the co-teachers see themselves as the partners in this relationship, sharing their roles equally. They expected their co-teachers to be well prepared for the whole session so that they could plan the delivery of activities on the go. Nevertheless, they were also prepared to cooperate and negotiate in case of a novice or an underprepared partner.

CTI 16 If partnered with a new tutor, I will take more responsibilities to ensure students get the important take home concepts, and for the class to run smoothly. Also be supportive to the new tutor, provide constructive feedback at appropriate times privately.

7.2.4.2 Positive Experiences of Co-Teaching

The literature reports the benefits of co-teaching in an assortment of contexts like inclusive education, pre-service teacher training, primary, secondary and tertiary education and professional development from past few decades. The reported benefits included improved knowledge and a lower student-teacher ratio (Bacharach, Heck & Dahlberg, 2008), academic development, support, increase in knowledge and expertise (Austin, 2001), professional growth, collegiality, reflective teaching and increased creativity (Ashland, 2009), professional and personal growth (Conderman & McCarty, 2003) enhanced motivation and job satisfaction (Villa, Thousand & Nevin, 2008).

This section addresses research question 5 to report on perceived and experienced benefits of co-teaching in HUMB1000. The thematic analysis of the data gathered by co-teachers' interviews to report those benefits of co-teaching realised while implementing co-teaching strategy revealed four main categories. These four themes are represented in Figure 7.4.

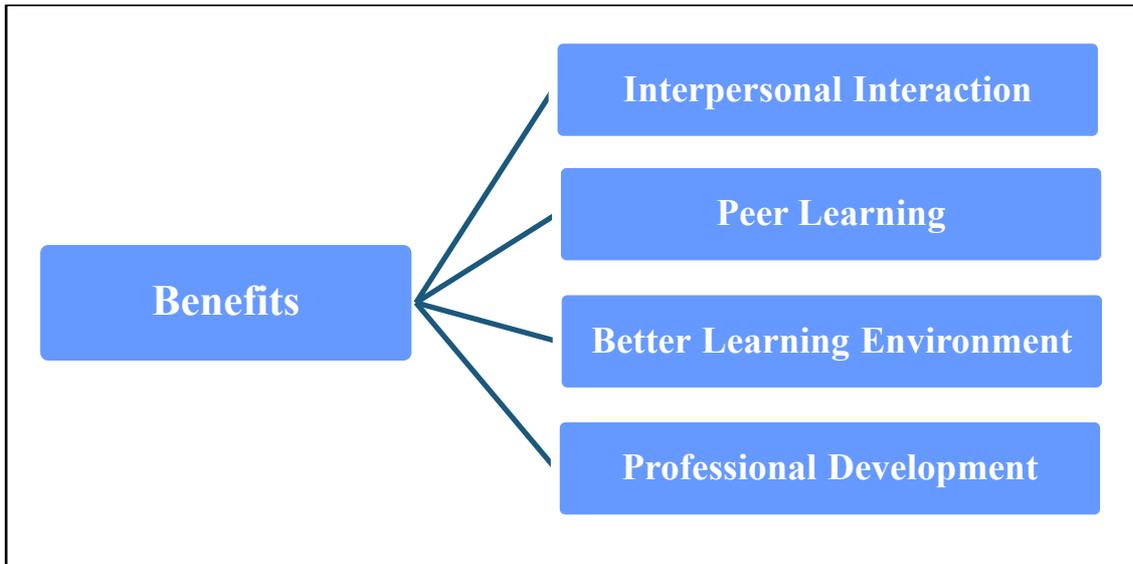


Figure 7.4 Themes representing benefits of co-teaching practice

a) *Interpersonal interaction*

Interviews with co-teachers revealed that most of them (88%) appreciated the presence of another professional with them in the classroom leading to interpersonal interaction. In addition to ‘hard skills’ students and teachers need to develop ‘soft skills’ in shaping an individual’s personality (Schulz, 2008). The interpersonal interaction between the dyads in a co-teaching partnership flourishes people’s skills like collaboration, communication, collegiality, teamwork and sociability. Some of the soft skills are considered key employability criteria in many work places around the world (Andrews & Higson, 2008).

Co-teachers reported that the company of another person in the class provided them with a lot of support in teaching and facilitating related activities. The sharing of workload made teaching less cumbersome and more enjoyable.

CTI 1 I like the cooperation the most. Whenever there are more people doing a task it seems lighter. The co-tutors make the mission easier.

CTI 3 In a two hour session, not to speak continuously for two hours, having a co-tutor while one can take rest while the other is taking over. The fact that you do not have to be responsible for all of the content is good. The fact that there is a backup and correct you if you make a mistake, which I think is obvious when you are teaching in front of a large class. Or if you forget something, they can come to your rescue. If you have got someone to help you to manage quite a high number of students, it is very helpful.

- CTI 8 *I like having someone else there with me. It is just a bit of security. I also often found on a Monday morning at 8 o'clock, if any link or resource was not working, I would send xxx to sort that out. I know that is not about teaching but as a UC for logistics that was really helpful. Also when classes finish at 8pm, it is a good security measure, you could walk to cars together especially young female tutors. That is an added bonus.*
- CTI 9 *We have a few students fainting and needing medical assistance, in that case if there are two of you, one can manage class and the other the sick student...I think there is a lot of benefit from theoretical and teaching perspective but also from practical perspective.*

The co-teachers also reported enhancement of some team teaching skills like communication, collaboration and collegiality during co-taught sessions. Pairing with different co-teachers in different semesters increased social interaction with many academic peers.

- CTI 2 *I like the collegiality that I have with my co-tutors, relationships that we develop.*
- CTI 7 *I like having two people in the class. I enjoy having a colleague, working with other people, interacting, teaming. I really enjoy working with somebody else.*
- CTI 12 *I like meeting other people in the classroom particularly if I have got a good relationship with the person, it becomes a joint exercise and you are doing this together. There is a shared expectation and understanding about what you are doing and where you are going. Teaching can be a very lonely task particularly teaching in a university where you are not even meeting in a staff room to discuss what is going on, who has done what and so on.*

b) Peer learning

Co-teaching creates an environment where co-teachers have an opportunity to witness teaching styles and strategies of their peers. They are also exposed to a range of knowledge and experience based narratives providing them a platform to critically self-reflect and incorporate relevant changes in their teaching. The process of peer learning ranked second in their comments with 65% of respondents (n=11) appreciating that co-teaching helped them to learn from their co-teachers and become better at teaching.

- CTI 4 *I get to know a lot of other things through co-teaching. I would have probably fixed my ideas to one concept. But the way other co-tutor would have taught same concept may probably be different. So learning different teaching styles and how you perceive same concept in two different ways. I get to know what other person is doing, thinking and getting more ideas and teaching styles.*
- CTI 5 *I really like to get some ideas, tips and different opinions because you teach different classes and the strategy you use in one might not work in another.*
- CTI 6 *Both tutors can learn from each other's techniques, benefit from each other's strength in knowledge and experience, and complement each other on their not so strong points.*
- CTI 15 *I love being chiropractor and have been paired with physiotherapist, medical student with epidemiology background, environmental toxicologist, scientist, teaching academic. I have learnt a great deal from everyone and I am sure that students have too. I have taken little stories that I heard from people and retold them in other classes to illustrate concepts.*

c) *Better learning environment*

The research literature reports the impact of the learning environment on student learning and academic achievement in higher education (Lizzo, Wilson & Simons, 2002; Pimparyon, Caleer, Pemba & Roff, 2000). Positive interactions between co-teachers may lead to a better learning environment. Respondents reported that the presence of another person in the class reduced monotony and was less intimidating, making them more confident, especially novice co-teachers.

- CTI 14 *It gives me probably more confidence, and students are also getting better bank for the buck.*
- CTI 12 *It makes class less intimidating in front of around 50 students.*
- CTI 13 *Each class with a different tutor is different so it does not feel very repetitive because you are not doing exactly the same thing, you can change different activities that you do differently from class to class, not teaching always the same material in the same way one after the other.*

Co-teaching with familiar peers was reported to be a helpful factor in creating a positive and relaxed learning environment.

CTI 13 I know my co-tutor well and we have a lot of fun in our classrooms. We look forward to it every week. It is a good chance to recap on our basic anatomy and physiology knowledge and I think what students appreciate the most is our sense of humour in the classroom and the way we bounce off ideas of each other. So being able to relate to students for a very late session in the day (4-6, 6-8 pm) where the students don't want to be there and I find that bringing that attitude to class that we enjoyed, students also enjoyed the classes.

CTI 6 also reported that the reduced student teacher ratio and the availability of two experts provided students with improved learning opportunities. The use of phrases “Two heads are better than one” and “Two for the price of one” were the quotes used to express such views.

d) Professional development

Specialised training or education to enhance professional knowledge, competence and skills is referred to as professional development in education. Continued professional development is key to keep oneself informed and up-to-date about the area of expertise. There are faculty initiatives to encourage educators to transform their teaching and student learning (Brancato, 2003) but co-teaching provides continuous professional development opportunities by receiving continuous feedback from peers. The co-teachers often critically reflect on teaching by asking constructive feedback from their peers or providing it to their peers. The following views expressed by two respondents resonate with the essence of this theme.

CTI 11 It's also an opportunity for me to observe and assess another tutor presenting information and observe teaching and observe the students' engagement and interaction with the teaching. This is a unique opportunity that has helped me in my teaching. Academics are time-poor; they don't have the opportunity to self-reflect. I think it is a cost-effective way of delivering content as well as providing the tutors with professional development opportunities.

CTI 15 The other thing is that rarely do you get an opportunity to observe other teachers which is great. They (uni) want to introduce a peer review process which I think won't work because there is a huge power differential from the person coming in as an observing and delivering

teacher. Whereas this way you can observe teachers as they teach and they can observe you as you teach. You both are on same podium and there is no power difference. You can get feedback on your teaching. We used to ask each other about teaching feedback.

7.2.4.3 Challenging Experiences of Co-Teaching

This section also attempts to address research question 5 by analysing co-teachers' responses to challenges encountered while co-teaching in HUMB1000. To perceive the challenges of co-teaching encountered by the co-teaching staff, the respondents were asked about any observed shortcomings and struggles encountered while co-teaching. There was a mixed response reported, depending on their personal experiences. It is understandable that "most probably in first week or two, you need to set up some basic boundaries...and I guess if you have taught for a long time as a single tutor, you may struggle to adapt" (CTI 9). The unit coordinator's observations to express major challenges to co-teaching are clearly expressed in her following comment from her experience:

The tutors that did not work well together, I found, were the ones that were not well prepared. They may be fully prepared to teach theoretically the academic content, but they had not touched bases with their co-tutor through email or text before the class, worked out a bit of a plan, come to an agreement and that's where we had probably two pairs that were not working together well. One of the things I suggested was that why don't you guys get together beforehand, not necessarily face-to-face, and get a plan so you know what you both would be doing, who likes to do what, you will work better together, keep your timing better. The workshop is pretty short on timing. I think that helped. Just be prepared and courteous.

Such observation was also confirmed by other respondents affirming the importance of planning, communication and collaboration.

CTI 5 If in rostering of the tutors those tutors are put together who have different points of view and strategies, they can have tough time. If combination is good, co-teaching is good. I am sure that not everyone likes co-teaching.

CTI 14 I don't think so, as long as there is rapport between co-tutors. It does not mean that it has to be a double act, it does mean that they have to be professionals and have

respect in the classroom. As long as that is maintained, I don't think there is any problem.

After analysing the responses of 17 respondents to the question 'Describe any perceived drawbacks in this teaching strategy', four main themes emerged namely *interpersonal interaction, parity, professional behaviour* and *others*. Figure 7.5 represents those themes generated from analysing co-teachers' comments to highlight main challenges faced during co-teaching.

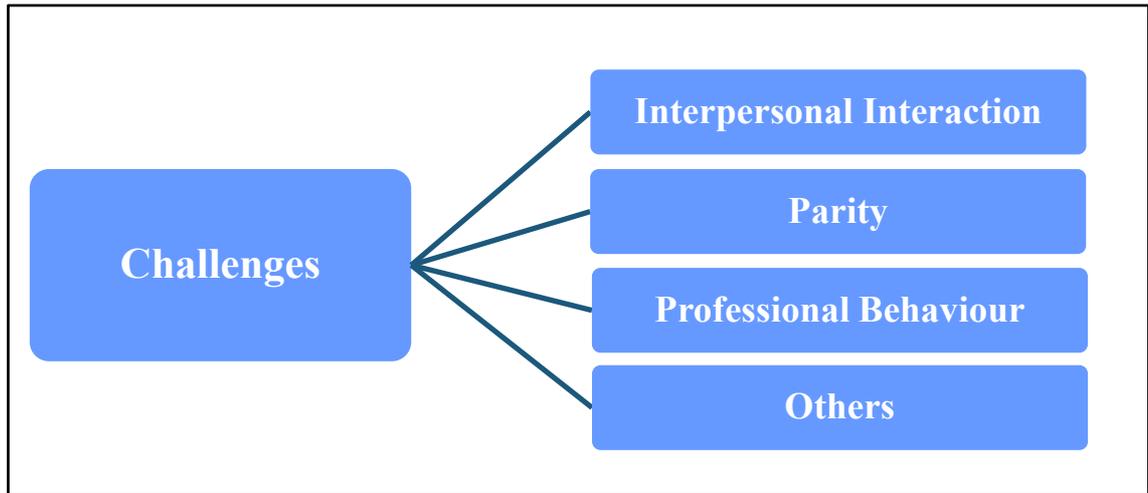


Figure 7.5 Themes representing challenges of co-teaching practice

a) Interpersonal interaction

One of the benefits of co-teaching is interpersonal interaction and if that ability is lacking in a dyad, it is going to pose challenges. Even if one of the partners is not actively engaged in collaboration, communication and planning, the smooth running of the session can be challenging. Disagreements about content, teaching style, professional views, time management and personalities can lead to conflicts. Such disagreements can easily be sorted through open and constructive conversation to negotiate the roles, but the challenge again is how and when, and co-teachers should be ready to take the positive feedback on-board. Seventy-six percent of the participants (n= 13) considered the lack of one or the other aspect of interpersonal skills as a drawback to co-teaching strategy.

CTI 2 If you do not agree with a particular style of co-teaching, or something that has been said, the challenge is to have that conversation with your co-tutor which can be uncomfortable. You have got to be working with a person and it's like being in a relationship where if you have a problem, you have to be open about them.

- CTI 7 *I think the perceived drawbacks are the personalities and trying to work together cooperatively. You have to establish ahead of time what the preferences are for the strengths and weaknesses of yourself, what you like to do and what you don't like to do, I think that's a drawback. If you can overcome that, I think it can work really well.*
- CTI 11 *If you have co-tutored with a tutor who has a different teaching philosophy and a different teaching style, and you are not compatible – that is an interesting challenge...*
- CTI 12 *I think a few couple of weeks you are feeling each other's way and what your personalities are like as well your teaching styles.*
- CTI 15 *The other drawback is that a few people are not happy when interrupted. They are very particular about their time in limelight. That is difficult because if you have another perspective and want to have that for student benefit and feel that you can't interrupt your co-tutor, then that does not allow your experience to be communicated to students ... It is good if a tutor is ready to accept help and feedback from other tutor.*

Unfamiliar co-teachers, poor organisation skills, time management and lack of teamwork would also negatively impact on the co-teaching experience.

- CTI 3 *I know my co-tutor well. So if you do not know who you are going to teach to begin with, I think that can be intimidating especially for a new teacher, one who is not experienced with the unit and has just jumped on board and has never taught before, I think there is potential for someone to be apprehensive about teaching with another person*
- CTI 6 *One tutor running the show while the other tutor is just assisting or observing most of the time; tutors may have personality clash; in case of planned & shared topics – one tutor may go “overtime” leaving the other to rush and try to cover material in such a limited time*
- CTI 13 *The time management is really the only issue. The other tutor takes a little bit too long with the task or would tend to repeat what I had already said in a different way and that just makes everything take twice as long. If the tutor takes too long it can impact on the other tutor who is taking over the next part*

b) *Parity*

The key essence of a co-teaching partnership is parity between the dyad sharing equal responsibility in planning and delivering the content. If any factors like power relations or dominating co-teachers impact the relationship, it can jeopardise the experience. The co-teachers might lose confidence and self-esteem due to lack of parity.

CTI 3 *They may say that you are a junior member or a sessional staff member and you are teaching with one of the senior members, I think that would be somewhat intimidating. You may feel that you are being potentially judged, your knowledge is not going to be as sound*

CTI 5 *If one is dominant and is there for long time and the other sits back, then it is not good in terms of respect and also students can see it as not good.*

c) *Professional behaviour*

The third observable theme was lack of professional behaviour. It was reported that if co-teachers are underprepared or unprepared, displayed a lack of respect towards their partner or were not punctual, the co-teaching interaction suffered negatively.

CTI 1 *If there is any kind of ignoring, discounting, and disrespecting that can make a tutor suffer. Disagreement and miscommunication can happen that can jeopardise the relation*

CTI 5 *It can create a problem when one tutor doesn't show up and the other tutor is left to handle the whole class, where teacher-student ratio is compromised.*

CTI 6 *Acting unprofessionally, one co-tutor didn't give me enough time to deliver content and used up more than the time allotted for the topic. Often, my co-tutor kept butting in, almost insulting and undermining me - must be a personality clash, or maybe she felt threatened and not welcoming my approach in teaching. The students were affected and became restless; and noticed the clash*

CTI 12 *If you have unequal people, unequal knowledge and unequal experience and a non-reflective tutor. All of those are fine as long as I feel that I have got someone who is thinking about the class 'what is going on' and 'the effectiveness or not of the strategies we are using'. Anybody can bounce off ideas and give support but someone who is not reflective, and then it becomes very difficult. You feel you are carrying somebody and that can build resentment. It is not a happy experience*

d) Others

Some other criteria that the respondents identified were loss of class autonomy, lack of self-reflection and proper training to co-teach.

CTI 10 The tutors are not trained to teaching that way (co-teaching). It could be effective but I have yet to see it. I was not able to watch videos of good team teaching in delivering content.

CT 12 Having other tutor present takes away your mental capacity to reflect on your teaching. I think in a classroom teaching by myself I can reflect at the end of the day what I did wrong or what I did best, how I can improve. Whereas having another tutor in class with you sometimes your focus is on them I think it is human nature that you keep finding faults with other people. So sometimes you might not be focussing on yourself but your attention is on your co-tutor

On further enquiring if the participants had experienced any conflicts during their co-teaching experience, 41% of the responding co-teachers (n=7) never had any conflicting situation and had an enjoyable and successful experience. Contrary to that, 59% of the respondents (n=10) had experienced conflict with one or more than one co-teachers. The majority of the co-teachers who experienced conflicts (70%) had initiated or been facilitated to participate in an open conversation to sort out the differences, compared to others (30%) chose not to. More than half of them (57%) who chose to negotiate resolved the differences and continued teaching amicably, whereas, the other 43% agreed to disagree and compromised. This clearly depicts that such unpleasant encounters can be avoided by open constructive conversations.

7.2.4.4 Suggestions to Improve Co-Teaching

This section discusses co-teachers' suggestions to improve the effectiveness of co-teaching for future implementation and addresses research question 4. The interview analysis indicated a positive attitude towards co-teaching strategy albeit highlighted a few challenges encountered while implementing this pedagogical approach.

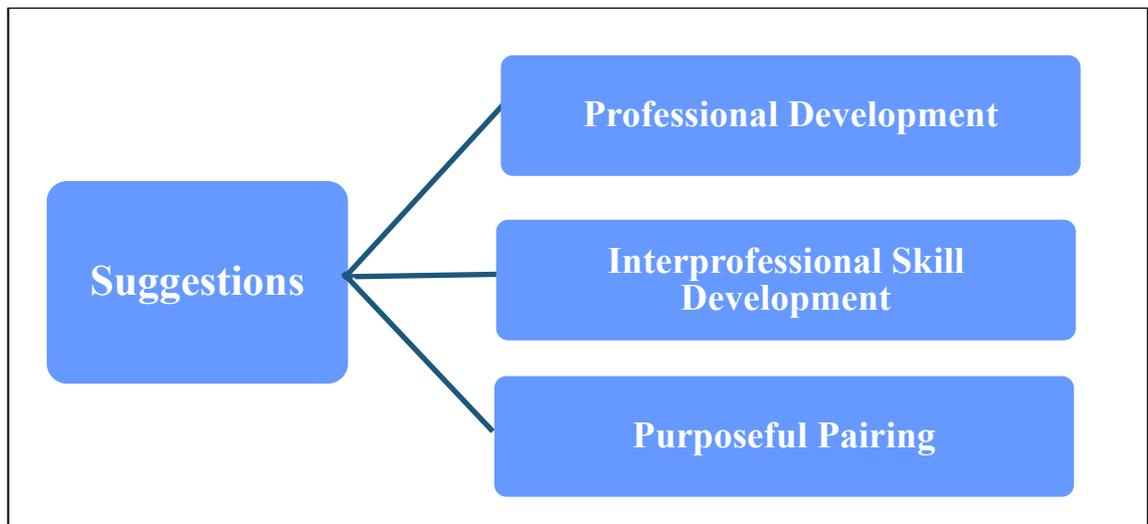


Figure 7.6 Themes representing suggestions to improve co-teaching practice

On further probing for suggestions to improve co-teaching in future, the data analysis revealed three major categorical themes, namely: *professional development, interpersonal skill development and purposeful pairing*. Only one respondent did not provide any suggestion directly related to co-teaching improvement but was a general content related comment. Figure 7.6 represents the themes generated to analyse co-teachers' comments and suggestions on how co-teaching could be improved to increase its effectiveness.

a) *Professional development*

A persistent suggestion proposed by the respondents for improvement of the strategy was providing co-teachers with in-service professional development workshops to familiarise them with the educational philosophy underpinning this strategy. It was suggested that familiarity with co-teaching philosophy, models and strategies and benefits offered by this pedagogical approach would facilitate effective co-teaching. Three quarters of the respondents (approximately 75%) recommended that a proper co-teaching induction training would be an effective measure to bring all the co-teachers to same level of understanding and application of co-teaching pedagogy.

CTI 17 *I think one of things that probably is needed is more induction into co-teaching. Involve all staff even if they are doing it for quite few years. When you have to work with completely new people, not quite into co-teaching mode, they have done single teacher teaching. Suddenly having them land in two teacher system, how to share workload, how to motivate students.*

Some respondents highlighted the specific aspects of co-teaching that they would like an induction of.

CTI 12 I think a workshop that is modelling interactions, problem solves and talks about the strategies to deal with interactions that set out a code of behaviour for co-teachers about how they interact prior to classes and the expectations of the co-teachers. At the moment I have seen nothing that really reflects the sort of expectations that I am looking at for someone coming into the class.

The co-teachers' statements also revealed that a hands on session where various strategies, actual challenging and rewarding experiences could be discussed would be helpful to all.

CTI 6 A tutor's session of sharing ideas & teaching methods in delivering certain key aspects of the unit; especially, visual and effective way of delivering the content to the students. Maybe one tutor has good feedback in a manner of modelling an aspect of the lecture that students at the end of it had a "light bulb moment" and commented "now I get it" afterwards.

CTI 10 It is probably a good thing to put in a workshop that is valuable ... But certainly how do you resolve conflict, misinformation, bounce ideas off each other, how a nice ducktail arrangement work would be good to watch. Should tutors distribute the activities or both tutors should be involved in each activity? In true sense of 50-50.

CTI 12 Setting up a set of expectations for tutors who are doing co-teaching about contacting the person beforehand about agreeing on the timing and a structure for the class, for negotiating how they are going to run the class, what is involved in the class, would improve the effectiveness.

b) Interpersonal skill development

In addition to developing professional skills of co-teaching, the respondents also acknowledged upskilling of interpersonal behaviour. The co-teaching academic cohort primarily constitutes of sessional academic staff who are generally only available on campus when they have teaching sessions/meetings. The unfamiliarity of various co-teaching academics impacts on developing a collegial social interaction. Lack of common planning time and unfamiliarity of co-teachers is reflected in poor communication, cooperation and collaboration for planning the sessions. The following comments of the

responding co-teachers reflect the need to improve interpersonal skills to facilitate a positive and effective co-teaching relationship.

CTI 1 Having regular staff meetings with unit coordinator where co-tutors have an opportunity to meet and talk to each other.

CTI 3 If we explore that a bit, that knowing your co-tutor, we do have tutor meetings and an opportunity to meet your co-tutor. I know it is understood that you should have email address of your co-tutor and that you discuss how it would be delivered, but even then a meet and greet session at the beginning, where you can sit down with your co-tutor and discuss your background, strength and weaknesses and come up with a strategy before you go to your class. So you are both comfortable with that. I think if co-tutors can go to their first class with confidence about each other and their first class goes well, then the confidence will be there in future classes.

CTI 9 I think if we had a little bit of training with specific strategies that may help and reinforce the importance of communication and courtesy and being prepared, and I think vast majority of people do all those things anyway.

c) Purposeful pairing

In their statements, the responding co-teachers reported that purposeful pairing strengthened the co-teaching interaction. Familiarity with the co-teacher and prior interaction was a stepping stone for a productive interaction. The following excerpts provide evidence for findings that purposeful pairing would increase effectiveness of co-teaching interaction:

CTI 12 But I also have to be careful who you put together. You can't just randomly throw teachers together and expect there will be a really good outcome.

Some strategies could be employed to match personalities or preferences to pair teachers up in a co-teaching relation.

CTI 1 May be a survey questionnaire relevant to teaching styles and personality of tutors so that they could be matched...

CTI 2 Also I don't want to come out as being sexist but having male female co-teaching partnership may be more conducive to classroom environment only because I hear that the problems that sometimes arise is between two

female tutors. I think that male female dynamics work well.

The onus is also on experienced co-teachers to guide and train their peers in the absence of any formal training.

CTI 15 With large turnover of tutors in HSF, the difficulty is that some tutors who are acquiring those skills may be lost and then what will happen is that the new tutors will be looking to older, more experienced tutors, for ways to work. But they take a back seat and never really get thrust into doing it themselves. Sometimes we tend to, whether we like it or not, take a bit more of a leadership role in the classroom that, may be, enables the teacher to stand back a little bit whereas we should be encouraging them to have a go.

The interview results revealed that most of the co-teachers perceived co-teaching to be a productive strategy but due to a lack of proper understanding of its philosophy and training to implement it effectively creates some challenges. However, these challenges could be resolved if co-teachers were supported by proper training.

CTI 15 If I am thrown back into co-teaching I think I still will have those challenges because you don't know who you will be going to teach with. From my experience of co-tutoring in four semesters, the quality of classroom experience is totally dependent on who you are teamed with. I have been very fortunate but obviously all of them have not been. They have had personality clashes but when co-teaching works well, it works so well, better than any individual alone, but if you are paired with the wrong person it is much worse ... There is a variable of the other person.

The above comment clearly emphasises the importance of the co-teacher in defining how effectively a co-taught class would be delivered.

7.2.4.5 Impact on Teaching Praxis

Co-teachers were also questioned if their co-teaching partner's teaching behaviours had any impact on their own teaching praxis. The aim of asking this question in the interview was to find answers for the research question 3(c). This section reports on the analysis of co-teachers' responses to this question. There was an overwhelmingly positive response (88%), affirming that the partners of various co-teachers influenced their teaching

practice. Only two participants did not agree that co-teaching interactions impacted on their own teaching practice. One of the two (CTI 3) was a young graduate who believed that years of being taught by different teachers gave him a better understanding of how students learn. Also he chose to co-teach with only one partner consistently which did not give him much exposure to a range of teaching experiences.

CTI 3 I have seen a lot of tutors teach me, and I have seen the ways I do and don't want to be taught. Though it is not a co-tutor model, but I have incorporated those experiences from past to guide my own teaching...I had only a couple of opportunities to teach with others, and I did not see anything that was striking that I wanted to cooperate into my teaching. As mentioned earlier, my co-tutor and I were very much in tune with each other, with similar ideas of how to teach that was very conducive to classes as it was consistent with students

Co-teachers who reported an influence used both positive and challenging experiences to transform their teaching practice. One of the respondents (CTI 12) mentioned that “...you can tell from week 1 whether it is going to work cooperatively. So you may not have lot of negotiation about what you are teaching and where you are teaching but because of the person's ability to interact positively in the classroom, you develop within about 3-4 weeks very effective working relationship that tends to work”. Use of strong descriptive words like “yes, absolutely” and “most certainly” emphasised the impact of peers on each other's teaching practice.

CTI 4 Yes. They wouldn't influence me completely as my teaching habit wouldn't change because of the co-tutor but I think it definitely is modified.

Further analysis of data to find some common themes that impacted the praxis revealed two categories that were mainly influenced namely *professional impact* and *social impact*. The themes representing the analysis for impact on co-teacher's teaching praxis are reported in Figure 7.7.

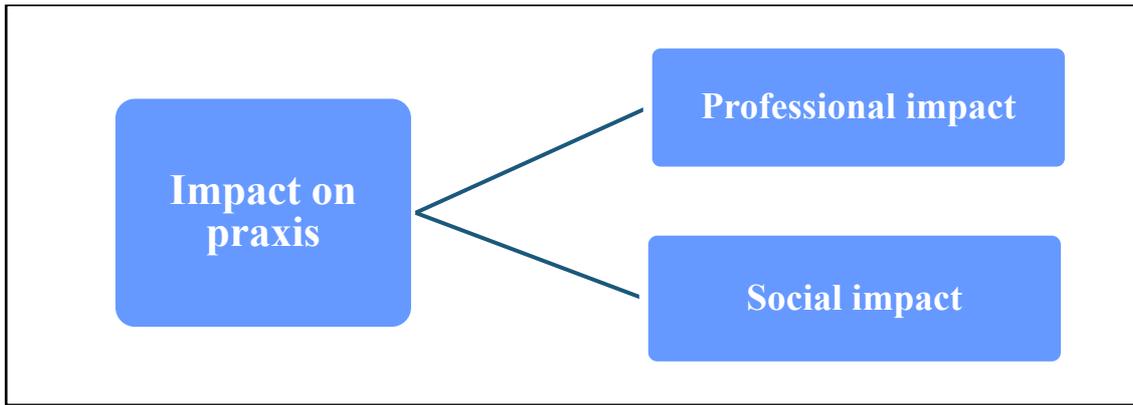


Figure 7.7 Themes representing impact on co-teachers' teaching praxis

a) *Professional impact*

Prominently reported comments impacting teaching praxis fell under the category of professional impact. All the participants (n=15) who reported co-teaching having impacted on their teaching practice made a comment on their professional learning. The major areas of learning were teaching strategies and styles. The following comments illustrate the professional learning journey of some novice and experienced teachers where co-teaching had provided them with a rich platform for professional development in a supportive and inspiring environment.

CTI 12 *Sometimes they (co-teaching partners) will have done a session with another tutor and will come to class saying, let us do it this way and we try it that way and often it is taking co-tutoring further with the interaction of the classroom. Yes I reckon, if it works, then I'll think I'll use it my later sessions. It often gives me permission to go further than I would have gone otherwise*

CTI 13 *From each tutor that I have taught with, I have taken on different things that they have done and tried to use that in my own teaching. I have used this as learning because I didn't have any teaching experience before and I didn't have my own teaching methods ... and now use some of those methods. I think it is like a continuous learning, even after doing this for 5 semesters, I still pick up different things. I teach with different co-tutors in different semesters and they all come from different backgrounds, have different ways of doing things, so I think I am continuously observing what they do and if I think what they have done was good or worked well, then I'll probably use that in the next semester if I was tutoring with someone different*

CTI 15 *Absolutely. I think reflecting on my own teaching...There was one particular tutor who taught me a lot about facilitated teaching and she would not give more than 2-3 min intro and tell students to work it out for yourself. And seeing that rapid approach to teaching, taught me a lot. From my experience of previous semester of holding hands and guiding students I learnt to throw them in the deep end. In terms of time management that works a lot better. What you (researcher) taught me a lot about was layering teaching. It comes back to flipped classroom and online lectures...What you did was that you took them from basic info to current level and involved students by asking questions. This was the stage I didn't address in my teaching...I learnt a lot from another tutor about analogies. She would use a lot of analogies, a lot of acronyms and pneumatic...That's how I believe I have changed as a tutor during the process, less hand holding, more layering and hopefully more consolidation of concepts*

The participants also expressed that in addition to learning about different teaching strategies, content and examples, they grew in their professional capacity by critically observing and reflecting on their own practice. They appreciated how making minor changes like adding humour, enthusiasm and real-life examples could make the learning environment more effective and authentic thus creating better learning experiences.

CTI 1 *With one of the tutors I used to run two sessions. We would swap our activities in the two sessions. In one of the sessions I realised that she was explaining the activity much better than I would have so I asked her to continue with the same activity in other session also as it would benefit students more*

CTI 2 *It has made me rethink what I share, and give real life applications to the content that I deliver. But also one of my other co-tutors tends to follow what is there in tutor guide and explain exactly the way it is written...I can see what to do and what not to do. I filled in once for a sick tutor and the co-tutor there was very relaxed and funny. You could see that the students enjoyed being in class with him and his comedic nature came naturally to him. He had a very good rapport with students...Being in this class with that tutor made me see that side and remind me that I can do a good job while smiling and that students loved to be in that class. I think that rubbed off a bit on me.*

Critically reflecting on our own teaching practices, observing others and absorbing such practices that would fill in the gaps promotes a well-rounded teaching personality.

b) Social impact

Another important aspect of co-teaching is meeting new co-teachers in different sessions/semesters. There is a rich diversity of co-teachers from different ethnic backgrounds in this unit creating a cross cultural collegiality. One of the respondents related her experience when she had just joined and how her co-teacher supported her.

CTI 5 *Co-teaching was a new experience for me, and I was new in Australia, she would support me with language and terminology. Also in terms of tips how to engage students, how to use my voice and talk with them. Each time I went to class I was prepared with the content. But while teaching if I would have difficulty in pronouncing words, she was really nice to support me there and help...In some cases if students would ask me a question and it was not clear to me she would rephrase the question for me to understand properly and respond*

CTI 6 *Co-teaching with different tutors for several sessions during the semester promotes interprofessional and cross cultural collegiality. It provides affirmation of individuality*

Observing a positive and interactive collaboration portrayed by the co-teachers inculcates a rich learning experience for students as well.

CTI 7 *I also enjoy the social element of the co-teaching. As students see that you get on with your co-tutor and there is camaraderie, a bit of joking if you can get that, because teaching should be fun. Learning should be fun and I always try to bring in a light hearted element to learning. We are all different and I think that is the strength of co-teaching*

In a social context, one of the experienced co-teacher reported how she, in her role as a co-teaching partner, tried to monitor and review her partners for an enriched teaching experience.

CTI 12 *I stand back and let somebody else come in and take control of the session. If they are competent I am happy to do that and monitor what is going on. So my role as a co-tutor in that situation becomes far more monitoring and*

assessing where the group is and what the group is doing and trying to add value

Overall, the comments of one of the respondents (CTI 11) sum it up. There is mutual learning at both professional and social levels.

CTI 5 So it is not only teaching relation but also social interaction. You can build your social interaction with other people if they want. I agree especially for me because I was new to country. So getting that support and help from my co-tutors was really helpful

CTI 11 Most certainly – it was a terrific opportunity to observe and assess the delivery and the teaching style of the other co-tutor and I would say that it was a worthwhile and enriching experience because it helped me improve my teaching practice. It helped me in terms of my own self-reflection and trying to identify my certain strategies for teaching that I thought were effective. What I always try and do is when the other tutor is presenting, I'd be listening and observing to how they are teaching but also observing the students to see if they are engaged and receptive and what sort of questions they respond to. It's very interesting from that perspective. It is a very unique opportunity for professional development

In general, the participants conveyed that the experienced co-teachers provided them with an opportunity to grow by reflecting on their current practices, and the less experienced co-teachers provided them with an opportunity to mentor while negative experiences taught them what not to do.

CTI 16 Experienced tutors have a very positive influence on my practice/ideas, e.g.: encouraging tutor interactions, new illustrations for concepts, key areas to highlight to students. Less experienced tutor will require me to pitch in more effort in driving the class, in terms of time keeping, concepts, running of activities.

7.3 Summary

In this chapter, an effort has been made to portray the overall picture of perceptions and experiences of co-teachers who teach together in a single teaching space. Semi-structured interviews conducted with seventeen participants helped to provide a detailed conceptual understanding of co-teaching model by co-teachers and their experiences. The views

expressed by co-teachers initially drew a picture of the perceived and operational (implemented) model of co-teaching leading to the experiential and learned (attained) model (Van den Akker, 2003). There was an overlap between co-teachers completing the survey and interviews, but there were some who participated in either of the two data collection methods. However, the patterns and themes expressed in CPES were consistent with co-teachers' views expressed in the interviews. In both cases, the participants reported co-teaching as an effective teaching strategy that could be more effective with some minor adjustments of support and professional development.

In response to research question 3(a), most of the responding co-teachers perceived co-teaching as a shared partnership but a few had an alternate concept of 'you teach, I teach' that lacked much collaboration and cooperation. Co-teachers used a combination of co-teaching models informed by the learning activities. They frequently used a combination of one teach, one observe; one teach, one assist; and station teaching models. Alternate co-teaching model was never used, and parallel teaching was tried rarely with unsatisfactory results. Increased familiarity endorsed more teaming opportunities. Co-teachers also reported that interaction with their co-teachers also impacted their teaching praxis professionally and socially (research question 3(c)). They were exposed to different teaching styles and strategies, content knowledge and experiences. Such interactions also increased interprofessional interaction, learning, experiences and engagement. Interprofessional teaching and learning was the one of the ideal (intended) key theme to implement co-teaching. Socially, the co-teachers experienced cross cultural collegiality widening their experiences from a different social context. Also their critical self-reflection and comparing themselves with others alluded to the do's and don'ts of co-teaching.

In response to research question 5, the benefits reported by co-teachers were interpersonal interaction, peer-learning, better learning environment and professional development. The co-teaching academic cohort employed to teach in HUMB1000 primarily constitutes sessional academic staff whom I consider as WIWO (Walk In, Walk Out) teachers. There is a constant factor of unfamiliarity and lack of common meeting and planning time due to their specific working schedules. The co-teachers reported challenges such as lack of interpersonal interaction, parity, professional behaviour and others. These were mentioned by very few but were of consequence since the sample size is small. The lack of interaction with peers created most of the challenges. There is a need to overcome these challenges to make co-teaching more effective.

Co-teachers also suggested strategies to improve effectiveness of co-teaching (research question 4) such as professional development, interpersonal skill development and purposeful pairing. Hence, by systematically organising teaching pairs, giving them time to grow together supported by professional and interpersonal skill development opportunities, co-teaching will be more effective. Prominent findings from students' and co-teachers' data suggest that co-teachers need training on how to co-teach effectively and develop collegiality for better student-teacher interactions, thus, creating an effective learning environment. Initiating a cogenerative dialogue between the co-teaching pair to discuss the issues encountered impacting effective teaching and learning could deal with most of the challenges. Such discussions could be initiated at the commencement, a quick huddle while co-teaching or as reflection at the end of the session (Guise, Habib, Thiessen & Robbins, 2017). A cogenerative dialogue involving students and co-teachers has a potential to transform teachers' interpersonal behaviour and pedagogical praxis and also improve students' engagement, achievement and behaviour (Rahmawati, Koul & Fisher, 2015).

The co-teachers also provided a real picture of the implemented and attained co-teaching strategy operational in the classrooms. By visualising and comparing implemented and attained versions of co-teaching strategy with intended version, any shortcomings could be addressed to increase its effectiveness for better student and teacher experiences.

Chapter 8.

Being a Co-Teacher – A Reflective Journey

8.1 Introduction

This chapter presents my teaching journey outlining the transition from an experienced solo teacher to a co-teacher. As my journey evolved, I am documenting an account of interactions and learning experiences with my co-teachers while co-teaching an introductory Human Anatomy and Physiology unit to first year undergraduate students at Curtin University in Western Australia. I strongly believe that life experiences are great teachers and every interaction teaches us something valuable if we reflect and keep an open mind and an enthusiasm to learn. All opportunities, whether positively or negatively perceived, are opportunities to acquire new insights and always have value to the person willing to learn. Some experiences suggest what is to be avoided and others reinforce the right practices. A willingness to learn from co-teaching partners, as in this case, offers an opportunity to gradually evolve and enhance the co-teaching cohort's teaching skills and knowledge. While recording my teaching experiences, I also address research question six to reflect how these encounters have influenced my own teaching and learning.

As a co-teacher, I also joined the teaching cohort without any conceptual or philosophical understanding of co-teaching. The inception of the idea to explore co-teaching was because of my observation and experience of the variations in the implemented version of co-teaching. I wanted to explore if there was an ideal co-teaching version, and if any changes to the implemented version could make it more effective. Hence, I embarked on the journey of exploring co-teaching.

8.2 About the Researcher

I have been teaching since 1988 in different educational settings (primary, secondary and tertiary) with a break of only three years. During my teaching career I had always taught as a solo teacher until 2011 when I started co-teaching in HUMB1000. During my 27 years of teaching experience, I have travelled and taught different curricula in different

countries adding richness and variety to my own personal learning and teaching journey. Also while delivering content through solo teaching, I taught from primary to undergraduate classes. My major teaching experience comes from teaching in schools where the role of a teacher is considered more to be a ‘sage on stage’ rather than that perceived currently in higher education as a ‘guide on side’. My experiences were also developed throughout my teaching career as I taught Indian, American, British and Australian curricula at different levels and in different countries, adapting my teaching and content to their specific philosophies of teaching.

I have studied and was trained as a teacher in the Indian education system. As we usually teach the way we are taught, I followed the same didactic “chalk and talk” method of teaching as I had been taught. But as a visual learner myself, I would pay attention to elucidating information diagrammatically on the board and initiate interaction with students while teaching. I struggled to be an innovative and empowering teacher due to large class sizes, overloaded content-based curriculum and the requirements of a standardised and highly regulated education system.

I am a trained human biology teacher who can teach content, but I have no practical experience in health care system or understanding of how human biology content knowledge is applied in real life situations in patient care. I am a teacher at heart who loves to explore innovative ways to educate students and cater to their difficulties in learning. I have an open mind, keen to learn from those who offer me any opportunity to enrich myself from their knowledge, skills or experiences. I also agree with Dewey’s quote ‘If we teach today’s students as we taught yesterday’s, we rob them of tomorrow’ (Dewey, 1944). There was an enthusiasm to explore diverse and effective teaching approaches, given an opportunity, which was provided when I moved to Australia.

8.3 About the Unit

After joining Curtin University as a teacher, I started co-teaching a core unit of Human Anatomy and Physiology taught across all undergraduate courses in the Faculty of Health Sciences. As discussed earlier (Section 3.5.1), this unit was introduced in Semester 1, 2011, at the same time I joined the teaching team. The unit runs in both semesters with different cohorts of students. In Semester 1, 2016 the unit catered to approximately 2,000 students from 23 undergraduate courses, with 43 interactive workshop sessions every week from Monday to Friday for 12 weeks. These numbers

have been largely consistent from 2011 till 2019. Each session is led by 2 co-teachers. The number of teachers servicing the unit for Semester 1, 2016 was 33, out of which 27 were sessional (casual) academics and 6 were contractual or tenured faculty members. In Semester 2, however, the number of students is comparatively lower and hence lower teacher numbers.

As previously described in Chapter 3 (Section 3.5.1) the content is delivered through a flipped teaching strategy where lectures are presented as i-lectures on Blackboard (Curtin University's Learning Management System) and face to face activities are conducted in workshop sessions, using various learning resources and activities, to further facilitate understanding of the content. Co-teaching was implemented as a teaching strategy in these workshops where two teachers with about 48 students would facilitate teaching and learning. The majority of the teachers are sessional teachers and usually opt for more than one session per week giving teachers an opportunity to work with different colleagues. Such experiences to co-teach with different co-teachers possessing different experiences and expertise, diverse educational and cultural backgrounds, educational philosophies and personalities has helped to shape this chapter.

In order to maintain consistency in unit organisation, three staff meetings are organised in each semester, first at the commencement, second in the middle and the third at the end of semester. All the teaching staff is invited to meet administrators, new teaching staff (if any) and interact with their co-teachers. Discussions are held to update content and activities and feedback is sought on classroom operations. Even though it is a very interactive meeting, all staff are not always able to attend due to other work commitments, or working only part-time.

8.4 About the Co-Teachers

Since I started teaching in Semester 1, 2011 till now (Semester 1, 2019), I was offered an opportunity to co-teach with 26 different teachers excluding teaching interactions with teachers in occasional replacement sessions. This experience has tremendously added to my expertise not only in teaching strategy and teaching philosophy, but also content and classroom management. All of my co-teachers came from diverse educational, professional, social and cultural backgrounds with various years of experience and interests. This interaction not only helped me to evolve my teaching identity but also trained me and enhanced my teaching skills and knowledge by requiring me to critically

reflect on the differences between mine and their teaching beliefs, pedagogies and practices.

Co-teaching involves co-learning (Roth & Tobin, 2005) not only in content but also in pedagogical practice by critically reflecting on our own teaching practices. Critical reflection of self is empowering as it can reveal and transform your own teacher identity (Rahmawati & Taylor, 2015). While engaging with my co-teachers, I began to analyse our joint interactions and also reflected on their behaviours and practices. This guided me to improve and evolve my own co-teaching practice. In the first semester of my co-teaching journey, I co-taught with five different co-teachers which helped me to develop my co-teaching. Then in the following semesters new experiences were added with many new interactions morphing me into a better and more experienced co-teacher.

8.5 Novice Co-Teacher

I had moved from the east coast of Australia to the west coast and received an opportunity to teach an undergraduate Health Science unit at Curtin University. This was my first experience to co-teach an undergraduate unit in an Australian university. My first session as a co-teacher was the first session (Monday, 8 am) on the first day of the semester with the unit co-ordinator. It was a mixed feeling, excitement for starting a new job but also anxiety of a new teaching environment. I was really anxious on my first day. I was confident about the content to be taught, but I did not know how two of us would co-teach. I had met the unit coordinator only once during my contract negotiation under very different circumstances where the power relationship was obvious. In my other co-taught sessions, I was aware that there would be another teacher with me, but there was no communication, negotiation or discussion on the structure of session before we started to co-teach. I knew their names but had not met and am sure that would have been the case with many of the teachers starting that semester.

Just before the session, the unit coordinator requested to take a lead role because it was the first session on the first day of a new unit. The unit co-ordinator also wanted to monitor the content, design and delivery of the interactive workshop session. Although meticulously planned and carefully executed, sometimes, when implemented, the timing does not work perfectly. So we both agreed on her taking a lead role while I assisted in these sessions. It was more of a 'one teach, one assist' (Friend & Cook, 2007) type of co-teaching. This arrangement helped me to build confidence and perspective of what to

teach and how much to teach. In due course we both developed confidence in each other's capabilities and would support each other during teaching and also exchange feedback at the end of the session on what worked well and what did not and how the session activity or timing could be improved for following sessions. It was a great team building experience for me.

I am recalling some anecdotes to help me present an evidence-based journey of my growth as a teacher/co-teacher. During this journey my teaching philosophy morphed from a solo teacher teaching in isolation to a more collaborative teacher by embracing a new environment of teaching. My horizon expanded and grew from 'a sage on stage' philosophy to 'a guide on side'. I feel that the philosophies of Bandura (1977), Bourdieu (1990) and Lave and Wagner (1991) discussed in Chapter 2 (Section 2.2) are reflected in my co-teaching journey. It elucidates how as a novice co-teacher who started by performing at the margins, developed a community of practice, then grew and learnt from the habitus. The journey continued till I became a part of the community of practice and habitus and in that process started guiding and mentoring novice co-teachers.

8.6 My Positive Learning Experience

My personal understanding of co-teaching from the literature was that both co- teachers have to interact and support each other while co-teaching the session (Friend & Cook, 2007; Murawski & Dieker, 2004). But I had diverse experiences with my co- teachers. Some would actively engage and interact during co-teaching, some would share activities but not interfere when other was teaching, and some would dominate their co-teacher. In some cases it seemed to be a team effort but in others, it looked like 'you teach, I teach' type of role sharing. My experiences with some of my co- teachers who had a positive impact on my growth as a co-teacher are documented here onwards.

Anecdote 1

After co-teaching with the unit coordinator in the first session, I was paired in my second session with a critical care nurse who was teaching in higher education for the first time. I had a similar understanding with him as I had with my unit coordinator in the previous session, but here the roles were reversed. I would take the lead role and he would not only support me during teaching but also add a wealth of information and examples on how each of the topics would lead to managing patients in real work place. It made the

learning for students more authentic and helped them to make connections with what they were learning and why. I would discuss the content and activity with students and he would bring in the application aspect of that activity, a perfect learning scenario for students. This type of interaction also helped me personally to become aware of the application of the knowledge imparted to students in a real work place conditions such as dealing with patients with different health care requirements. I would absorb these examples and then implement them in my other co-taught sessions.

This specific interaction reports when we were discussing osmolality of solutions. After discussing isotonic, hypertonic and hypotonic solutions, he asked students where they would use this information in patient management. After guided discussion and prompting, students were able to comprehend that it would help them to decide the fluid osmolarity in the IV drip given to different patients depending on their specific requirements.

Anecdote 2

In another session, I was paired with an extremely motivated teacher who had decades of teaching experience in various educational settings. We both connected well from the beginning and agreed to employ various strategies to foster better learning among students. I was encouraged by her enthusiasm, energy and persona in class and realised what actually being a teacher means. Our joint effort to identify and support students who needed more guidance allowed me to be a teacher again. We would collaborate before, during and after teaching sessions and I felt that it was co-teaching in its real sense. We continued our interaction outside classroom and now we are working on research projects together to support and strengthen co-teaching in this unit and the university.

We would use role play, real life examples, analogies and anecdotes to reinforce concepts. For a cell division demonstration, we would wind our arms and a leg around each other's to demonstrate crossing over and pairing of homologous chromosomes. Students would really enjoy watching and actively engage in discussion about various aspects of cell division. The perception of chromatids and chromosomes, difference between separation of chromatids and homologous chromosomes during mitosis and meiosis role played by both of us was appreciated by students for concept development. We also jointly

developed ‘rapid fire round questions’ to engage students and assess their prior knowledge of the topic. I also learnt from her various strategies to support student learning and vocabulary development in biology like use of acronyms, etiology etc.

Anecdote 3

While co-teaching with a chiropractor, I became conscious of incorporating the latest research findings in the field of human biology while teaching. He had in depth understanding of the content and would explain the concept in a very structured and concise way. He had a very direct approach and came to classes with great enthusiasm and a positive and open mind. We would give each other feedback prior to starting the session on how our other sessions worked and adapt changes for better student learning and experiences. We both would also pitch in if need be and it flowed well and created a very interactive and interesting learning environment for students. We were also effective in reading verbal and facial clues of each other in case any of us needed support in terms of forgetting a term or citing an example.

During one of the sessions while discussing microorganisms he discussed a research paper finding that suggested the presence of E.coli on toothbrushes if kept close to the toilet in a bathroom. This really drew the students’ attention to personal hygiene and proper hand washing while working in a health care industry. As this was my first semester of co-teaching, I would sometimes forget a term due to stress. He could read that through my facial expressions and would immaculately jump in with right term at right time without disrupting the flow of information.

Anecdote 4

I have also had experiences of co-teaching with a few pharmacists and with one in particular I shared a very strong professional bond. We had great inter- personal chemistry and together brought much energy to the class. We complemented each other’s teaching style and worked towards each other’s strengths. We could easily read each other’s body language and thus support each other while teaching. The “chalk would flow” very easily between the two of us.

While discussing transfer of an action potential through the synapse, she mentioned how there is continuous research to develop medicines by targeting release, reuptake or breakdown of neurotransmitters that influence pain, depression, mood and emotions. I

had always been curious how a pain medication effects different locations of pain. This was an ‘aha’ moment for me.

Anecdote 5

Early on in the first semester, while co-teaching in one of my sessions, I had a slip of the tongue and cited an incorrect muscle name for a specific category of muscle type. My co-teacher, who was a physiotherapist, was listening intently in case she needed to respond. After I had finished explaining, she quietly pointed out the error to me, without being judgemental. I appreciated her input, thanked her for that, and then corrected that error in front of the students. The matter was sorted out amicably without any ill feelings for each other or further disruption to class or learning process. A similar situation arose in another session with another pair of co-teachers who did not handle the situation well creating a poor professional experience and bad perception of each other. This also affected student’s confidence in the co-teachers. This interaction reinforced the fact that proper communication at right time and in proper way goes a long way to foster a healthy co-teaching relationship.

Anecdote 6

In another session I used to co-teach with a teacher from a different cultural background who spoke with a strong accent and could not, at that stage, pronounce certain scientific terms clearly in English. I occasionally found it difficult to understand some of the words she spoke, so I was aware of the difficulty some students might be facing in class. I was in a dilemma on how to approach her and start a conversation to address this problem. I really appreciated the open mindedness of this co-teacher who acknowledged and was aware of her pronunciation problem and during our conversation gave me permission to intervene and reiterate the word if I felt her pronunciation was difficult for students to follow.

In the beginning I would be listening to her and also reading student’s faces concurrently for any blank moments and intervene appropriately without putting down my co-teacher. Slowly it developed into a process where students would look at me and I would pronounce the word or write that on the board. The students respected her teaching ability and content knowledge and together, she and I along with students, found a way to overcome this challenge without compromising student learning or teacher’s credibility.

This was an instructive learning experience for all of us that emphasised ubiquitous nature of the multicultural environment where we need to work collaboratively to each other's strengths and support development and progression.

8.7 My Challenging Experiences

I have been fortunate enough to have worked with very professional, knowledgeable and efficient teachers. I did not have many challenging experiences, partly, perhaps I always went to teach with an open mind and was ready to adapt to different teaching styles. While I never had any confrontational or unpleasant experience, I am documenting some of my experiences which, I believe, taught me to avoid developing these habits for a better co-teaching relationship with my co-teachers.

Anecdote 7

One of my co-teachers was a very experienced, knowledgeable and resourceful person but had a soft voice. It was my first experience of co-teaching with her and I had great regard for her ability as an academic. While I would be teaching, she quite often, to add extra information, would pitch in without any indication. By the time I could register she already would have completed at least a sentence. It would give an impression as if she was talking over me which in fact was not. After a few such episodes I learnt to be more thoughtful of her presence with regular eye contact so as not to miss her willingness to add valuable information without students considering it to be rude.

Anecdote 8

Being trained as a teacher, I have learnt to deliver the content in a very structured way, starting with simple perception and then adding information slowly to build up the concept. A different co-teacher, who was also a trained teacher, had a habit of interjecting with information that I had planned to deliver along the way. This would interrupt my thought process, disturb student's concentration and would also throw me off track. When I discussed this dilemma with her co-teachers, they also were of the same opinion.

Both the above-mentioned cases made me realise the need to have a conversation with the co-teacher regarding the subtleties of content delivery strategy before embarking on a joint journey of co-teaching a class. This became quite evident from student's remarks

(Sections 5.2.4 and 5.3.2) who, in some sessions, thought it was rude when a teacher intervened while the other teacher was still speaking. There is a fine line between collaborative teaching and interruptive teaching. I was not sure if it would be appropriate to discuss my concerns with my co-teachers but I learnt to adapt and be aware of the challenges. Such experience reveals the importance of training of co-teachers and also providing tools and training necessary for communication and creating a shared vision of classroom teaching.

Anecdote 9

As mentioned earlier in Chapter 6 (Section 6.2.1), the majority of teachers teaching this unit are sessional academics who come to teach on specific days and so teach multiple consecutive sessions. This unit is also a content-heavy unit with a lot of interactive activities in the face to face workshop session. It takes a lot of effort and energy to get through each session. In one of my late afternoon sessions, I was teaching with a co-teacher who was in his third consecutive session for the day. I do not know whether it was his relaxed approach to teaching or simply being tired, but I would not see much enthusiasm in his teaching. I would wonder if it was morally right to expect students to be eager to learn and interact actively when the teacher himself or herself was not enthused to teach. As teachers it is our responsibility to model a behaviour that would stimulate teaching and learning process. Will the students feel motivated to learn if the teacher does not emulate an enthusiastic approach and eagerness to teaching and learning process?

Anecdote 10

Adding to the diversity of my co-teachers was another teacher from a different cultural background with a self-acknowledged challenge of fluency in English and pronunciation difficulty. This was my most challenging interaction with a co-teacher. We had developed a good professional relationship over years during staff meetings and involvement in a research project, but never had an opportunity to work together. When we started teaching together I observed him to be very enthusiastic in class and supported students in their learning. He was open to experimenting with different teaching strategies. I had conducted an interview with him previously regarding his experiences while

co-teaching and was aware of the challenges he had encountered. I wanted to provide him with a very positive experience in these sessions.

When I started to co-teach with him, I became aware of a few challenges that we needed to work on for a pleasant co-presentation of our sessions. I realised we differed on the basic concept of philosophy of effective teaching in our co-taught sessions. My emphasis was on teaching the right content by whosoever felt confident to do so, whereas, he would stress on each person's specific role while co-teaching, more like 'you teach, I teach'. My emphasis was not on conversational fluency but adequate accuracy of academic content and subject specific language proficiency in our co-taught sessions. I encourage proficiency in teaching appropriate concept rather than answering every question in a worksheet which the students should be able to address themselves if they understand the concept. As educators, it is our professional responsibility to rise to the expectations of our students and set higher standards of academic achievement and proficiency.

After a few weeks of teaching together, I was not satisfied with our sessions. I appreciated his initiative for a dialogue to work on some issues that he was uncomfortable with. We had an open discussion and set some guidelines for following sessions. We tried working along our accepted plan but I was faced with another dilemma. I felt during interactive discourse with students, he was undermining his credibility as a teacher in front of students by his questioning technique. In some instances I felt he was not prepared beyond the scope of that session.

In a few sessions when students asked a basic question about the anatomy of a particular structure, he said "I have no idea" or read verbatim from the answers provided in the staff teaching material. He would also confirm the correct response in front of students from me which I felt did challenge his competence. In one instance he contradicted my response to a question in front of students, which I then had to clarify with students tactfully without undermining his respect. He had interpreted the question wrongly creating confusion in concept building in students' minds.

We had another dialogue session; I gave him my critical reflective feedback which he accepted graciously. I believe he took my feedback on board as well

as I did his and used it constructively to improve our teaching practices to the best of our abilities. We did not have any further confrontations for the rest of the semester. Did we ignore our difference of opinions, compromised, or agreed to disagree to maintain class harmony, I am not sure.

My personal belief is that each one of us possesses certain distinct skills, insights, experiences and knowledge accumulated through life experiences and educational journey which can be used as a guide for others who are willing to partake in such reciprocity process. All the positive and challenging experiences mentioned above have guided me to define and shape my own co-teaching identity by accepting what I valued as effective teaching practices and avoid confounding teaching behaviours.

8.8 My Role as a Mentor and Educator

In the current context of co-teaching at Curtin University, at the time of writing this chapter of my thesis, I have completed eight years of co-teaching. I started co-teaching as a complete novice in Semester 1, 2011 but these years of co-teaching experience and exposure to associated literature has transformed me into a better co-teacher. As described by Darwin and Palmer (2009), the academic landscape is changing and with limited time and funding suggesting “What is needed is the development of more collaborative models to fit the contemporary landscape – more innovative and meaningful ways to develop professionally as colleagues who are equal but different” (p. 126).

Mentoring is a synergetic partnership between two individuals, the mentor and the mentee, both aspiring for mutual development in their teaching areas. In this relationship, the mentor generally has greater skills, experiences, and wisdom (Weinstein, 1998). In their extensive review of literature, Clark and Andrews (2009) defined peer mentoring in higher education as “a dyadic relationship in which a senior or more experienced individual (the mentor) offers career and psychosocial support to a less experienced or junior colleague (the protégé or mentee) (p. 36).

Regardless of empirical evidence supporting the positive impact of mentoring programs in higher education (Johnson, 2006; Mullen, 2008), there are few formal mentoring programs implemented to support new faculty members. A more collaborative ‘mentoring circles’ approach (Darwin & Palmer, 2009) involves either one mentor counselling a group of mentees or a group of individuals supporting and assisting each

other. I envisage co-teaching as a remedy to mentor newly appointed teachers through constant constructive feedback in a supportive environment.

Lately, I have been paired with some novice co-teachers and I have assumed responsibility for tacitly mentoring new co-teachers. Although it is not a formal mentoring process, it is a preferred way to initiate the teachers newly introduced to co-teaching. I have co-taught with three novice co-teachers who verbally acknowledged to me their appreciation for the guidance and support provided to them during their transition from a single teacher to a co-teacher. There are also instances where other newly inducted co-teachers would attend and observe my co-taught sessions with my co-teaching partners or other experienced co-teachers to understand the class dynamics. With my new co-teachers, we discuss beforehand the portion they are comfortable to handle or find challenging. We also interact in class by communicating through gestures, verbal cues and eye contact and thus support each other.

During the preliminary stages of data collection (interviews) and informal discussions with fellow co-teachers, I became aware that many co-teachers did not understand the philosophy of co-teaching. One of the co-teachers expressed his concern by saying “we were thrown in the deep end and, we swam the best we could”. Moreover, some co-teachers had encountered challenging scenarios and were not familiar with conflict resolution strategies. I gathered anecdotal details of all such encounters experienced in this unit. Based on this information I, with the help of administrators, organised a workshop for all co-teachers co-teaching in HUMB1000 and other co-taught units at Curtin University educating them about the concept, benefits and challenges of co-teaching. Using the scenarios encountered, the participants were encouraged to engage in a discussion to offer amicable solutions during such conflicting situations. This workshop was greatly appreciated by the participants.

CTI 5 Recently, you and some other person organised a really interesting workshop. I attended that before starting the semester...I had no idea about co-teaching. Because this was a really interactive workshop, it was good time to share your experience and opinion. I got few tips from presentation and used those in classes. It did help, though I could not apply all strategies as workshops are quite content heavy and we have to follow time guidelines. But in theory yes it was very helpful.

8.9 Co-Teacher's Perceptions about My Co-Teaching

So far I have discussed my personal encounters and experiences with my co-teachers. During informal discussions with my co-teachers regarding their experiences teaching with me, I was enlightened about my own teaching abilities and shortcomings.

Anecdote 11

One of my co-teachers appreciated the way I organised my teaching in a very structured way, from simple to complex in a progressive way. As previously mentioned, this unit employs a flipped classroom strategy, so I personally feel that all students need to start the face-to-face interactive session with a common base. In the beginning of each session I ask the students 10 questions based on the i-lecture which are relevant to that day's lab work which form key concepts for that weeks' learning. I call this exercise 'rapid fire round'. He also appreciated my asking simple, direct and close ended questions to groups of students at the beginning of a session to build up their confidence and increase their attention and interaction in the class.

Anecdote 12

Another of my co-teachers did not agree with my policy of 'no mobile phone use' in the class, although they could attend to any important call outside the class. I advocate this policy because the students do not need to research any of the topics being discussed in the class, and if need be, there are books available as a resource. I was not aware of his disagreement because there never was any negotiation on class management. Recently, while working on a project, he mentioned to me that he was not completely in support of such policy. And that is when I realised how many times co-teachers would have disagreements with their partners that remained unresolved because they were never discussed!

Anecdote 13

Also my feedback to students' response to questions asked in some cases, as mentioned by another co-teacher, was very enlightening to students. For many of the questions, as they answered, I would mark them out of 5. Though all the responses were correct but they were not complete scientifically. Such quantifiable assessment would make students stop and think what was

missing to lose marks. This exercise consequently made students aware of the importance of using correct biological terminology and explaining a process systematically and not just using short cut answer responses.

8.10 Summary

While writing this chapter, I revisited all the significant positive and challenging experiences encountered while co-teaching in this unit over the last eight years. It gave me an opportunity to reflect on my own teaching identity and growth as a co-teacher. My past experiences and anecdotal discussions with other co-tutors brought to the fore the flow down effect of co-teaching training which needed to be documented. The experiences gained from each one of my peers were used by me in many other sessions benefitting innumerable students and fellow co-teachers. Many of my co-teachers picked these helpful attributes and used them in their sessions with their co-teachers. Such flow down experience created a web of interactions and development of learning communities (Scantlebury, Gallo-Fox & Wessell, 2008) within this unit (HUMB1000). Such interactions highlight the uniqueness of co-teaching providing co-teachers a rare opportunity to capitalise on diverse and specialised knowledge of their peers, sharing knowledge and skills to construct a novel method of individualised learning (Thousand, 2005). During this reflective journey, I address research question 6, as to how this research journey has impacted my own view of teaching and learning. I also developed an understanding of intended, implemented and attained versions of co-teaching.

To grow as teachers, we should be able to reflect on any issues faced, explore and strive for improvements and experiment with new strategies and ideas to develop and strengthen our practice (Feldman, Altrichter, Posch & Somekh, 2018). These educative encounters should inform and transform our current practices for future development (Gallego, 2001). As the novice teachers experience professional improvement and personal satisfaction, their sense of self-worth improves. Consequently, with provision of professional learning and work environment support there is better teacher retention (Buchanan, Prescott, Schuck, Aubusson, Burke & Louviere, 2013). Co-teaching provides an opportunity not only to collaborate and create better teaching and learning opportunities for both teachers and students but also provides support to solve problems. By sharing responsibilities and increasing interactions, it creates a positive teaching environment (Wilson & Blednick, 2011).

The core questions that arise thus far are ‘what establishes a good co-teaching relationship’ and ‘what does it mean to be a good co-teacher’?

Irrespective of the review of literature (Chapter 2) and research findings discussed in Chapters 5, 6, 7 and 9, from my personal experience perspective, the five C’s important for any good co-teaching relationships are communication, collaboration, confidence, compatibility and constructive feedback. The other features that play an important role in positive experiences of co-teaching relationship are; support, open-mindedness, respect, etiquettes and ethics. As suggested by Walkington (2005) “Mentoring, rather than supervision, by the experienced teacher promotes a collegial relationship that fosters each individual pre-service teacher to develop his/her own identity as a professional teacher” (p. 63). Research has suggested that planning, communication, relationship, classroom applications and knowledge base of co-teaching are five main components of successful co-teaching team (Bacharach, Heck & Dahlberg, 2008).

Before embarking on a co-teaching journey, the co-teachers need to communicate and get to know each other. Successful co-teaching does not just happen, but evolves with investment of time and effort, and readiness to negotiate and plan (Rytivaara, Pulkkinen & Bruin, 2019). This can be organised during a staff meeting or as a social gathering initiated by administrators or unit coordinators. Such interactions help to build a rapport to open up discussion on co-teacher’s expectations and vision of class management and teaching styles. Understanding each other’s class visualization will help in guiding and structuring their collaboration. They can have a shared vision of teaching a class together rather than load sharing. By communicating and collaborating towards a shared role, they will develop confidence in each other’s capabilities and work towards their strengths and simultaneously improve on their weaknesses. This process will help them grow further together, supporting each other.

Once this process is established, the co-teachers will have better compatibility opening up opportunities for an open and honest feedback. Being able to self-reflect and get constructive feedback regularly will help shaping a positive co-teaching relationship between the co-teachers and support their growth as worthy teachers. But to facilitate this cycle, the co-teachers need to have an open mind and be flexible to adjust to various teaching styles and philosophies. There are some subtle, unspoken etiquette that co-teachers need to follow to experience a healthy co-teaching relationship. Friend and Cook (2007) have argued that co-teaching is a ‘professional marriage’ (Scruggs, Mastropieri, & McDuffie, 2007) and both co-teachers need to transform their individual perspectives

to a shared one for a harmonious and integrated front (Howard & Potts, 2009). Like any other social relationship, co-teaching interaction also needs nurturing by supporting, communicating and respecting each other's visions and sentiments.

The above stated process is the summary of my understanding of co-teaching through my personal experience. The process of open communication and reflection has really shaped me to become a better co-teacher. From my experience, if co-teachers consider the five C's, it will really help them grow into efficient and effective co-teachers. Co-teaching is an experience that is deeply rooted in socio-cultural context where according to Bourdieu (1992) 'habitus' allows to reinforce or modify experiences by 'being-together-with-another' rather than by trial and error as silo teachers (Roth, Lawless & Tobin, 2000). I personally believe that I was fortunate enough to learn and grow with and from the students I taught, and the co-teachers I taught with. It provided me with continuous professional development in a conducive environment because of the open and honest feedback exchanged on daily basis with my fellow co-teachers. By blending content skills and practical skills of various teachers and health care professionals, students will be more engaged constructing biological knowledge and understanding in a variety of ways.

Chapter 9.

Summary, Conclusions, and Recommendations

“I never teach my pupils, I only attempt to provide the conditions in which they can learn.” — Albert Einstein

9.1 Introduction

The present study was undertaken to investigate students’ and teachers’ perceptions and experiences of co-teaching in their respective domains in a first-year undergraduate interprofessional core Health Sciences unit at Curtin University in Western Australia. This study stemmed from my diverse co-teaching experiences while teaching with different co-teachers in the unit. The divergent perceptions of different co-teachers were a matter of concern. Henceforth, this inquiry was driven to find gaps in understanding of the philosophy of co-teaching by co-teachers and students and propose recommendations to transform co-teaching into a more effective pedagogical approach.

The literature supporting this research study has been reported in Chapter 2 of this thesis. A detailed design and implementation process was reported in Chapter 3. Chapter 4 established the development and validation of survey instrument used to collect quantitative data from co-teachers and students during this study. Chapter 5, 6 and 7 reported the analysis of result of students’ and teachers’ data collected during the research investigation. Chapter 8 revealed reflection of my own co-teaching journey during my transformation of teaching identity from a solo teacher to a co- teacher. The quest to understand co-teaching pedagogy, questioning existing perceptions of co-teachers and reflecting on my own transformation of teaching identity has driven this research work. The result of these research findings were aimed at improving co-teaching experience for both students and co-teachers, strengthening it and making it more effective.

This final chapter is designed to summarise and report the research findings of this study under two separate headings. The first part reports the major findings highlighting the lessons learnt during this research investigation in the form of students’ and teachers’

perspectives and experiences involving co-teaching interactions based on research objectives outlined in Chapter 1. The second part reports the significance and recommendations of the lessons learnt to be implemented and further supported by future research for better and effective co-teaching partnership in higher education.

9.2 Overview of the Research Design

The investigation reported in this thesis is about students' and co-teachers' perceptions and experiences of a co-teaching pedagogical strategy in an Australian University. The study is a mixed method, case study design observed through a post-positivist and interpretive paradigm lens. The quantitative data were collected from students and co-teachers using the CPES instrument, developed during this research process. The qualitative data were collected from students through eVALUate student responses and from co-teachers through interviews. The data analysis established the commonalities between results obtained through different methods of data collection reinforcing the conviction that different collection methods may have innate capabilities and limitations that could be reduced by multi-method research process.

The data collection started in HUMB1000 in Semester 1, 2015 and continued till end of that year. The student survey (CPES) was administered in week 10 to all 43 co-taught sessions and the eVALUate student comments were procured from the unit coordinator at the end of the semester. The staff survey (CPES) was administered to 28 co-teachers in week 10 but they were informed about the interviews earlier. Interviews were conducted and audio recorded, and organised around the availability of co-teachers. Both, qualitative and quantitative data were analysed and the major findings are reported in this chapter.

9.3 Major Findings of the Study

This section draws together the findings that this study set out to determine by addressing the research questions as outlined previously (Chapters 1 and 3) in light of the existing literature.

9.3.1 Research Question 1

Can a valid and reliable tool be developed to evaluate co-teaching perceptions of students and co-teachers in higher education?

The development and validation of a survey instrument to assess students' and co-teachers' perceptions and experiences of co-teaching in higher education was developed as a core component of the research design and investigation. The Co-teaching Perception and Experience Survey (CPES) instrument developed during this research investigation (refer Chapter 4) underwent rigorous analysis in a preliminary study (n=528), the main student survey (n=1,111) and the co-teacher survey (n=26). The CPES instrument was tested for its validity and reliability with all three samples as described in Chapter 4.

The CPES instrument was analysed for its factorial structure. The validity of this instrument was first established in a preliminary study and later by means of exploratory factor analysis (EFA) using students' and co-teachers' responses. The factor analysis of the data obtained from all three data sources (preliminary, student and co-teachers) resulted in a five factorial structure of the CPES instrument, thus demonstrating a strong factorial validity (Section 4.6.1).

The findings also suggest that the CPES is a reliable tool due to its high Cronbach's alpha reliability co-efficient presented during analysis (Section 4.6.2) using all three data sets (preliminary, student, and co-teacher). The Cronbach's alpha internal consistency reliability co-efficient of CPES in the preliminary study ranged between 0.83 and 0.93, student version between 0.85 and 0.90 and co-teacher version ranged between 0.77 and 0.90, thus suggesting high reliability of the instrument (Cronbach, 1951).

9.3.2 Research Question 2

What are the perceptions and learning experiences of students regarding co-teaching as a pedagogical strategy in HUMB1000?

In response to this question, quantitative data collected through the CPES instrument and qualitative data through comments specified in the eVALUate survey and the CPES survey were analysed (refer Chapter 5). The students overall perceived co-teaching as a positive pedagogical practice orientating more towards benefits, albeit reporting a few challenges too.

The analysis of quantitative data of student version of CPES revealed high mean scores (Section 5.2.2.1) for all the five scales, namely, Teacher Support (4.2), Teacher

Collaboration (4.0), Student Satisfaction (3.7), Teacher Equity (4.2) and Teacher Innovation (3.7). Students perceived parity between the two teachers exhibiting collaboration. The presence of two teachers was perceived to provide better support during their learning process leading to better student satisfaction. They also appreciated exposure to different teaching styles, expertise and teaching strategies experiencing diverse views fostering interprofessional knowledge creation.

Using a convergent parallel design to compare the resulting themes from the CPES survey and eVALUate comments, students' perceptions of co-teaching revealed similar outcomes. Considering the eVALUate survey comments were more detailed further elaborating students' viewpoints. Results of students' insights into the benefits and challenges of co-teaching in HUMB1000 are discussed subsequently.

Table 9.1

Consolidating themes from different data sources representing benefits of co-teaching

No.	Themes	CPES Survey	eVALUate
1	Diversity	√	√
2	Teacher Support	√	√
3	Better Learning Environment	√	√
4	Student-Teacher Interaction / Student Engagement	√	√
5	Professional Behaviour	√	√
6	Collaboration	√	√

The themes of diversity, increased teacher support, better learning environment, improved student teacher interaction, professional behaviour and collaboration were key features representing benefits of co-teaching.

One of the significant benefits that students perceive from co-teaching is diversity in various aspects (Section 5.2.3.1). Such conclusions can be drawn from students conveying enriched experiences through interaction with two different teachers from different backgrounds, experiences and expertise. Students also commented that such situations exposed them to different teaching styles and bodies of knowledge. Two different personalities can bring different perspectives and explanations improving students' content knowledge and understanding of the content. In summary, students who are co-taught consider themselves to be academically better prepared and advantaged because of being exposed to diverse perspectives and knowledge providing better

learning outcomes (Dugan & Letterman, 2008; Ferguson & Wilson, 2011; Kerridge et al., 2009; Roth & Tobin, 2004).

The present findings also suggest that students of HUMB1000 also appreciated co-teaching because it improved the student teacher ratio (Cook & Friend, 1995; Villa et al., 2004) providing students more chances to interact with their teachers and better opportunities to ask questions. Such behaviours in class enhance student learning and they feel well supported. The results also reveal that students perceive co-taught classes provide better learning environments wherein, the professional behaviour portrayed by co-teachers makes students aware of the expectations in their professional field. Such behaviour also models how to handle a difference of opinions respectfully and professionally and in some cases agree to disagree skilfully. It fosters team work, collaboration, communication and interaction skills.

Students are one of the important stakeholders and the “ultimate consumers of the educational product” (Maxwell, 2006, p. 20) in any educational setting. Views and opinions of their experiences are an ideal resource to understand how best to teach them. Wilhelm (2011) supports students’ voices considering them “the most powerful data source available to make us better teachers” (p. 49). Valuing students’ voices and the impact they can have on teaching was advocated by Noddings (2004) arguing “When we listen to them, we learn what they are going through, and this knowledge can be used to shape what we do in teaching” (p. 154).

9.3.3 Research Question 3

What are the perceptions of co- teachers regarding co-teaching as a teaching strategy in HUMB1000?

This research question was sub-divided into three sections:

a) What are co-teachers’ conceptual understanding of co-teaching as a teaching strategy?

The results of the present study revealed that the co-teachers’ perceptions about co-teaching were varied ranging from inconclusive to ambiguous to a clear fundamental understanding of co-teaching (Section 7.2.2). Considering that the co-teachers were not provided with adequate professional training for introduction and understanding of co-teaching, the co-teachers held diverse perceptions of this pedagogical strategy. They understood that the classroom teaching would be shared by both, but ‘how’ was unclear and different co-teachers perceived that differently.

Some co-teachers (23%) anticipated the sharing would be like load sharing. They would split the teaching content in half and teach their part while the other person would just observe and not actively engage. This resulted in 'you teach, I teach' situation comparable to the 'one teach, one observe' (Friend, 2014) scenario. The co-teachers reported they were cautious not to tread on each other's territory which suggests a lack of communication, collaboration and planning. This interaction is comparable to storming (Norris, 1997) and beginning stage (Gately & Gately, 2005) which are early stages of developing a co-teaching interaction. The interaction is superficial and guarded within boundaries.

The present study also suggests that almost half of the co-teaching cohort (47%) perceived the sharing comparable to distributing the teaching responsibility in which one teacher takes the lead role and the other supports in different ways. The roles were swapped during each session to give opportunity to both co-teachers to lead and to support. This represented the next stage of the co-teaching relationship formation entitled forming (Norris, 1997) and compromising stage (Gately & Gately, 2005). The roles were exchanged based on individual strengths and preferences. Such interaction represented the 'one teach, one assist' strategy (Friend, 2014) and signifies some amount of collaboration and communication.

Some of the co-teachers (29%) demonstrated very clear understanding underpinning the philosophy of co-teaching. They believed in delivering the content collaboratively while being involved at all times. They contemplated this active engagement continually while teaching by bouncing ideas of each other, filling in gaps, bringing in different viewpoints or supporting each other in other administrative tasks. They envisaged that such interaction would create Interprofessional interaction and students would learn watching their co-teachers lead by example. Such collegiality signifies an evolved co-teaching relationship comparable to norming (Norris, 1997) and collaborating stage (Gately & Gately, 2005) where 'the chalk flows freely' between the co-teachers. There is open and effective communication and they present a unified front.

This research question was also intended to gauge basic understanding of co-teachers regarding various ways co-teaching could be implemented in class. In this study, the seventeen co-teachers interviewed were asked which specific co-teaching model they implemented during co-teaching (Section 7.2.3). From the conversation during the interview with co-teachers, the absence of any philosophical or conceptual understanding of the pedagogy was apparent, hence the inability to explicitly name the co-teaching model

implemented. After a brief explanation and a pictorial representation, co-teachers mentioned which co-teaching models were used by them frequently in class. Out of the six co-teaching strategies described by Friend and Cook (2007), co-teachers reported to use most likely all of them depending on what type of activity/topic/interaction was being discussed. Co-teachers also reported that lack of awareness and training hindered experimenting with different effective co-teaching strategies.

None of the co-teachers had used an alternative co-teaching strategy. Only two co-teachers reported to have tried parallel teaching once, but found it unsatisfactory as it created lots of noise and disturbance in class. In light of HUMB1000 being a human anatomy and physiology unit, the students are expected to observe and comment on human models and specimens placed strategically at different stations. Hence station teaching appeared to be most commonly used strategy reported by all.

The other three strategies - one teach, one observe; one teach, one assist; and teaming were reported equally to be most frequently used strategies. However, one teach, one observe was preferred (53%) and reported first by many co-teachers interviewed. According to the literature, such strategy is used for collecting data or observation of students with special needs (Friend, 2014) and does not portray any active participation of the co-teaching dyad. Such strategy manifests itself as 'you teach, I teach' which defies the purpose of interprofessional collaboration and teaching. One teach, one assist is reported in the literature to be the most frequently used and least effective (Scruggs, Mastropieri & McDuffie, 2007) co-teaching approach. It is recommended to be used sparingly (Friend, 2014) until the co-teachers get comfortable with each other otherwise it questions the need of employing two trained professionals to achieve learning needs of students. Teaming, reported to be most advanced model portraying evolved collaboration among co-teachers was reported by 29% interviewed co-teachers as the main co-teaching strategy. Its frequent use is suggested by Friend (2014) as it exemplifies high levels of collaboration, communication and parity.

b) Is there any association between perceptions of co-teaching and demographic variables such as age, gender, nationality and educational qualification?

This research question was posed to investigate if selected demographic variables had any relationship with perceptions of co-teaching among co-teachers. The quantitative data analysed and described in Chapter 6 (Section 6.2.2.3) suggests that there is no statistically significant difference between perceptions of co-teaching among the participating co-

teachers based on their gender, academic qualification, teaching and co-teaching experience.

The results also suggest that while attending a professional development session does not have any statistically significant impact on the perception of co-teaching, those who did not attend any professional development session displayed a lower score on the Teacher Satisfaction scale. Also interesting is the finding that attending a professional development session to understand the philosophy and strategies of co-teaching was explicitly a major theme emerged from the co-teacher interviews to improve co-teaching.

c) How has co-teaching experience impacted co-teachers' own teaching praxis?

In response to this sub-question, if different co-teachers had impacted on their own teaching, most of the participating (88%) co-teachers answered affirmatively (Section 7.2.4.5). They acknowledged co-teaching as a worthwhile and enriching experience comparing it to continuous professional development opportunity. Co-teachers reported that it helped them improve their own praxis by observing their peers learning what to do and more importantly what not to do. Co-teaching with peers encouraged them to reflect on their own teaching and improve their praxis in key areas.

Professionally, there was a shared learning whereby co-teachers observed, learnt and experimented with different strategies and styles of teaching. They enriched their teaching experience by learning about the use of various real life examples, analogies, mnemonic and acronyms used by different peers. They also learnt how adding humour, sharing and supporting their peers, and better time management creates a relaxed learning environment. The strategies shared by their peers on student engagement, conflict resolution and answering student queries was another factor transforming their praxis in the long run.

Socially, the co-teachers reported to have become conscious of the positive impact of interpersonal interaction and interprofessional and cross cultural collegiality on their teaching praxis. In their solo teaching experiences, they would get limited opportunities to interact and exchange scholastic discourse, whereas while co-teaching it is a continuous occurrence creating more opportunities for professional growth. Co-teaching also helped novice teachers and non-native English speakers develop confidence to speak with the support of another person in their classroom. There was enhancement of interpersonal skills of collaboration, communication and social interaction of the co-teachers during interaction with their peers to discuss various aspects of teaching.

9.3.4 Research Question 4

What strategies could be implemented to ensure effective co-teaching and positive learning experiences for students and co-teachers?

Both students and co-teachers were asked their suggestions to improve co-teaching in the future and interestingly both groups alluded to similar considerations, which in my opinion is a robust outcome of this research study.

The co-teacher's responses to this question in the surveys and interviews revealed similar opinions (Sections 6.2.3.3 and 7.2.4.4). The main strategy to enhance co-teaching experience was to enforce a compulsory professional development workshop for all co-teachers wherein they would meet their co-teaching partner, familiarising with each other and establish some basic guidelines for a successful partnership. In this workshop, an introduction to co-teaching philosophy, various co-teaching strategies and conflict resolution should be discussed supported by a visual representation of effective co-teaching. There should also be an emphasis on reflection of the challenges encountered by different co-teachers and how they were resolved and also which strategy worked and which did not work. The feedback provided in this workshop could empower co-teachers to enter classrooms confidently and better organised.

The findings also suggest that a random pairing of co-teachers may or may not work, but if co-teachers are paired purposefully, there will be a better and positive outcome. A random arrangement of co-teachers together, without any training, and expecting a really good outcome is not a prudent strategy. It was further suggested that the dyads been given enough time and support to grow together and then keep them together as a role model for others. There were suggestions of mixed gender pairs, novice- experienced, different expertise pairs and similar teaching philosophy pairs.

The results also suggest that co-teaching is a learnt skill knowing when to restrain and when to talk allowing your co-teaching partner time and space to direct the classroom. The results also indicated that co-teaching involves content and pedagogical knowledge as well as interpersonal skills to work collaboratively in a team. The co-teachers are expected to possess transversal skills (UNESCO, 2016) to manage a changing learning environment influenced by globalisation, integration, social challenges etc. The "new professionalism" (Cepic et al., 2015, p. 8) emphasises modern teachers to transform their teaching styles to incorporate "a complex combination of knowledge, skills, understanding, values and attitudes..." (Cepic et al., 2015, p. 9), so as to teach students general thinking and transversal skills in addition to the content. In order to make co-

teaching effective, the co-teachers need training to develop transversal skills of critical and innovative thinking, interpersonal and intrapersonal skills and global citizenship (UNESCO, 2016), most crucial to this pedagogical strategy.

The students' comments from the CPES and eVALUate survey resonated similar considerations (Section 5.3.3). The challenges reported by co-teachers were perceived by the students also and hence similar suggestions for improvement policies (Sections 5.3.3 and 6.2.3.3).

The main aspect that needed improvement was to model professional co-teaching behaviour. Students suggested co-teachers be trained to teach together cohesively as they lacked an understanding of collaborative teaching. They reported a lack of role clarity and collaboration amongst the co-teachers. There was a suggestion of co-planning if the teachers were planning to teach together. There was an expectation of parity and fluid transition while teaching so that chalk could pass freely between the two teachers which call for collaboration, communication and planning.

The other suggestion was to pair co-teachers purposefully. The students and co-teachers observed that random pairing of co-teachers was not effective and led to conflicts. Suggestions to put together co-teachers that could work well together (Sections 5.3.3 and 6.2.3.3) or mixed gender pairs were mentioned. The unfamiliarity of co-teachers, lack of collaboration and planning together was also cited as the reasons leading to disagreements between co-teachers.

There were also suggestions for development of better interpersonal skills and teaching behaviours. Students recommended that both teachers should come fully prepared to teach the whole content of the session, and to interact and engage actively with students in their learning.

Based on students' and co-teachers' reported challenges, it seems that the two main lessons learnt from this research study are that if co-teachers are trained and paired properly, they can transform the co-teaching experience for both students and co-teachers. The concept of pedagogical content knowledge (PCK) introduced by Shulman (1986) is key to effectively communicating content knowledge to students but in the higher education landscape, there is lack of appreciation for pedagogical practice (Stierer & Antoniou, 2004) some even holding negative attitudes towards planning and training (Stark, 2000). Research evidence suggests that collaboration between different faculties in higher education have improved students' in-depth understanding of content and

skills (Campbell, 2010; McKenna, Yalvac & Light, 2009). In their critical reflection during a collaborative teaching experience, Patel and Herick (2010) reported positive experiences beyond increased content knowledge. They also reported an “increased sense of creativity” and “insight into best teaching practices” creating “student-centred instructions” (p. 66).

The changing structure of the higher education learning environment and the job market requires students to be well equipped with strong technical and scientific competencies. With a constantly changing global work environment, graduates are expected to be creative and innovative. To cultivate such skills, tertiary educational institutes have a responsibility to promote development of transversal competencies in graduates by integrating approaches that hone such skills at micro, meso and macro level of teaching (Sá & Serpa, 2018). A teacher’s role is critical in creating a stimulating learning environment. The transversal competencies of critical and innovative thinking, interpersonal and intrapersonal skills and global citizenship can be easily demonstrated through co-teaching. By modelling specific behaviours, the co-teachers can demonstrate teamwork, professional behaviour, active engagement and interaction, collaboration, communication, accepting different perspectives and critical analysis through co-teaching.

9.3.5 Research Question 5

What are the teaching experiences of co-teachers using co-teaching as a pedagogical approach with regard to (a) benefits and (b) challenges?

This research question was discussed under two sub-sections.

a) What benefits did they experience using co-teaching as a pedagogical approach?

One of the most significant observations to emerge comparing positive experiences of co-teaching from the data comparison between interviews and survey comments was the coherence of themes with an additional theme emerging from more detailed responses in the interviews (Sections 6.2.3.1 and 7.2.4.2). The major themes reporting benefits of co-teaching for co-teachers were *peer learning, interpersonal interaction, better learning environment and professional development*. Similar themes have been reported by various research studies in the literature (Chanmugam & Gerlach, 2013; Murphy & Beggs, 2010; Scantlebury et al., 2008).

The co-teachers appreciated and valued the presence of another person in the room to share the teaching time and space. The involvement with people of diverse socio-cultural and educational background with varied expertise and experience in a non-judgemental and friendly environment created opportunities for peer learning. Having to co-teach with another person provided a security and support safety-net especially for novice co-teachers. The co-teachers not only were exposed to different styles of teaching and co-teaching but also were acquainted with different perspectives and strategies for effective teaching and engagement of students.

The other findings reported the appreciation for interpersonal interaction. Co-teaching is a social phenomenon which enhances intra-personal and interpersonal skills through engaging in team work. The data revealed that most of the co-teachers valued collegial cooperation, collaboration and communication creating new social connections.

The data also indicated that having two people in a classroom to share the teaching load created less monotony and stress to talk for the whole session. Fewer students to teacher ratio further enhanced the learning environment. Another person to manage class administration or emergencies or student behaviour was also appreciated. A positive atmosphere due to relaxed co-teachers created a constructive and encouraging learning environment.

Observing another person's teaching style, content knowledge or even giving students ideas for better study techniques motivated a critical personal reflection. The co-teachers reported such critical self-reflection, and the giving to each other constructive peer-feedback without any ramifications, was a source of continuous professional development in a congenial environment.

Another subtle and not categorically reported benefit is the interprofessional interaction, learning and experience. Co-teachers reported that they benefitted from the diversity of knowledge and experiences of teachers from different professional and educational backgrounds. Such scenarios allude to interprofessional learning, a key consideration to implement co-teaching.

b) What challenges were encountered in implementing co-teaching?

The findings highlighted the challenges faced by co-teachers while co-teaching (Sections 6.2.3.2 and 7.2.4.3). Most of these challenges could be avoided by proper planning and training. The findings suggested that most of the problems related to unfamiliarity of co-teachers with each other and lack of any common meeting and planning time. Many

times the co-teachers reported seeing their co-teaching partner for the first time in their first session to be co-taught. In such cases, lack of proper familiarity and understanding of each other's pedagogical preference and teaching philosophy was a great hurdle. There was no discussion about expectations, class administration and teaching approach. The situation was further compounded by a lack of common planning time, resulting in at times a terrifying co-teaching experience.

The study also found that co-teachers did not have any clear perception of the philosophical understanding and specific strategies of a co-teaching pedagogy. They worked based on their own perspective which led to various alternate representations of co-teaching pedagogy such as 'You teach, I teach'. Hence they could not effectively implement co-teaching. Some of the co-teachers did not see each other as equals leading to disagreements, intimidation and lack of confidence.

Another important finding of the study was that most of the teachers had a single teacher teaching experience and hence did not have skills to work effectively as a team to demonstrate active collaboration, communication, sociability, collegiality and teamwork. Lack of such interpersonal skills led to conflicts. Lack of professional behaviour such as arriving late or coming unprepared or underprepared for the whole teaching session were some other challenges reported by some co-teachers.

In summary to this question, based on co-teachers' experiences, this study recognised that most of the challenges encountered were mainly due to unfamiliarity of the co-teachers and his/her pedagogical approach, lack of interpersonal skills and professional behaviour, and lack of parity and respect between the dyad.

9.3.6 Research question 6

How has this research on co-teaching in Health Sciences experience influenced my view of teaching and learning?

This doctoral research journey to explore co-teaching in higher education was initiated by my varied interactions with peers while co-teaching. These interactions had a powerful impact on my teaching experience and beliefs (Chapter 8). Coming from a different cultural and educational background, my teaching beliefs and experiences were very different. Co-teaching provided me with an exposure to a broad range of highly professional and experienced co-teachers who stimulated me to think and critically analyse my own teaching beliefs. Working with co-teachers from different cultural and professional backgrounds encouraged me to consider incorporating their positive aspects

and at the same time avoid the inadequacies in their teaching practices. Hence co-teaching helped me to transform my teaching identity from being a sage on the stage to a guide by the side.

Teaching collaboratively with my peers allowed me to observe and learn from their teaching practices. Thus, co-teaching not only helped me to transform my teaching identity but also improved my pedagogical practice. Some of my co-teachers were practising health professionals who would provide a real world application of a theoretical concept being learnt in class. Lacking such an experience revealed to me the practical applications of learning some concepts. The details of such experiences have been discussed in Chapter 8 of this thesis.

Finally, co-teaching interactions have also made me realise that teaching identity, once formed, is not permanent. It is continuously transforming and influenced by views, experiences and philosophies of people, students and teachers, and institutions we come across.

9.4 Significance of the Study

The study intended to provide me with an extensive and deeper understanding of co-teaching from students' and co-teachers' perspectives. This study is unique because it is the first of its kind in higher education in general and Australia in particular. The findings of this study significantly contribute to a growing body of literature in the field of co-teaching in higher education especially in the Australian context of interprofessional education, by providing a rich description of first-hand experiences of students and co-teachers. The significance of this study is twofold, one to me and the other to the larger educational community.

9.4.1 Significance to the Researcher

As a co-teacher, this research quest helped me to develop a better understanding of co-teaching philosophy and strategies (Chapter 8). It made me realise that the challenges and frustrations felt by me during co-teaching with the peers were experienced by others too. During this research process, I interacted with many co-teachers, interpreted students' responses and developed a better understanding of co-teaching. Knowing the challenges and strategies that could help me overcome those challenges guided me to develop my own educational practice and transform my teaching identity to grow into a better and more effective co-teacher.

9.4.2 Significance to the Educational Community

The conceptual framework underlining this research study to obtain holistic view of co-teaching in higher education was guided by Van den Akker's curriculum representations (Van den Akker, 2003). The research findings enhanced theoretical and conceptual understanding of co-teaching, highlighting the perceived pedagogy. The benefits and challenges encountered by both, students and co-teachers, highlighted the operational and experiential aspects of this pedagogy. Thus this study reports the intended, implemented and attained version of co-teaching in HUMB1000, highlighting some minor challenges encountered in its effective implementation. The challenges identified in this study could assist policy makers and administrators develop strategies to support the co-teachers by providing professional development opportunities and other suggested strategies for better co-teaching experiences for co- teachers and students. One of the significant findings of this study is to create a better understanding of how co-teaching experience can be enhanced by identifying potential obstacles to implement effective co-teaching. The educators, informed by the outcomes of this study, could apply the suggestions to work effectively with their co- teaching partners. For the broader educational community of educators, policy makers and researchers, the results of this research are of great significance. Once the barriers are overcome, co-teaching can also be used effectively in other interprofessional contexts.

Researchers could also use the CPES survey instrument to investigate co-teaching in different contexts, further validating the survey instrument and adding valuable information to this developing subset of co-teaching. This research can serve as a base for future studies to further enhance our understanding of co-teaching in higher education sector.

9.5 Limitations of the Study

During this research, I made some assumptions and realised some limitations as the journey progressed. Although the anonymity and confidentiality of the participants was confirmed, I had no control over the honesty and adequacy of the information provided by the participants. It was assumed that all participants, students and co- teachers, provided honest opinions and enough information to add value to this research. It was also assumed that a mixed method case study was an appropriate research design to develop an in-depth analysis of this case under investigation.

Sufficient rational effort was made to reduce limitations in this research study but some limitations were identified which were beyond my control. Regardless of identifying the following limitations, they did not directly impact the study undesirably and the anticipated research purpose was achieved with findings supported by literature from previous studies.

The first limitation of this research could be the validity of the survey instrument (CPES) which was developed by me during the research process. Although the instrument was developed after conducting a preliminary study (by recruiting students from three units), and then re-establishing its reliability and validity using a large student and comparatively smaller teacher sample size (from HUMB1000), it was not tested on a new and different sample or in another university. As a consequence, the generalizability of the instrument could not be extended to other situations beyond the case under study.

The second limitation of this research could be that the study represents the perceptions and experiences of students and co-teachers in the HUMB1000 unit, which is primarily a content-based unit. The experiences could be different for students and co-teachers in a unit that has an emphasis on developing different skills.

The third limitation of this research could be that the study was limited to only one unit of an organisation. It should be replicated in another unit or organisation with a different culture, learning environment or learning outcomes. However, the conclusion of this study could be used by administrators and co-teachers to better understand how to effectively develop any co-teaching partnerships. Further studies could be conducted in different learning environments to develop a deeper understanding of this pedagogical approach.

Also many co-teachers co-taught with multiple peers, but in the CPES survey, a general view was sought which could be a misrepresentation of their all experiences. Respondents may have had different experiences with different co-teaching partners. This limitation was addressed by asking details of co-teacher's experiences with different peers during teacher interviews.

Due to an insignificant number of student responses to participate in an interview, a detailed student perspective could not be obtained that may have further augmented my understanding of students' interpretations of co-teaching. This limitation was overcome to some degree by incorporating students' eVALUate comments.

Observation in naturally occurring social settings is a flexible and authentic data collection tool due to the nature of the data collected (Cohen, Manion & Morrison,

2011). 'In situ' data offers a reality check for actual behaviours of people (Robson, 2002) and provision to examine some behaviours that are less dominant (Cooper & Schindler, 2001). Class observation of co-teachers to explore co-teaching behaviours in class would have given me an insight into actual and observable behaviours authenticating the interview data. Such data would have drawn picture of how co-teaching manifests in actual classroom settings further supporting the identified themes or raising some other issues. Due to time constraints and logistical challenges, such data were not obtained and so not reported. For future research of this nature, class observation data would be valuable.

Another aspect that could have been explored and considered as a limitation was to collect responses from former students and administrators. Most of the members of the planning committee for establishing and designing HUMB1000 had either moved on to other universities or positions and were not available. I was still able to obtain informal feedback from one founding member of the committee and initial unit coordinator, which was helpful to gain a clearer picture of establishment of this interprofessional core unit.

Finally, despite appropriate rigor and depth of data collection, analysis and interpretation of results, researchers' and participants' bias might have impacted on reporting the results. I was employed to co-teach in this unit and hence introducing the bias about the topic. Though a semi-structured questionnaire was used for co-teacher interviews so as not to influence or direct the views of the interviewees, some co-teachers may not have answered honestly for fear of judgement by the researcher. To overcome volunteer participants' bias, the study was introduced as non-threatening, short and important with anonymous and confidential responses (Salkind, 2010). The context was familiar to both students and co-teachers. The data obtained from quantitative and qualitative methods were correlated and care was taken not to overlook any contradictory views during interpretation.

9.6 Directions for Future Research

As discussed above, I realised some unavoidable limitations in this study. These weaknesses open opportunities for future research and add significant knowledge to this growing pedagogical approach in higher education.

9.6.1 Improving the Validity of the Survey Instrument (CPES)

The CPES instrument was developed and established in this study with high reliability and validity scores. Further trials need to be conducted on a wider scale to establish comprehensive reliability, validity and generalizability of the CPES instrument in different contexts by testing it in other co-taught units in different universities.

9.6.2 Replications of the Study

Co-teaching is being implemented in several other units in Health Sciences and other faculties at Curtin University. A similar study could be replicated in other first year undergraduate core units in Health Sciences to contribute to better understanding of perceptions and experiences of co-teachers and students. Identifying challenges encountered while implementing co-teaching, presuming different sub groups may have different perceptions and experiences based on specific unit structure and outcomes, and hence providing enhanced support strategies to make it more effective.

A recommendation for a similar future study to make it more robust would be to incorporate student interviews or focus group discussions to comprehend better perspective and experiences of co-teaching from students' point of view. Also class observation data should be collected either by a person/researcher or by video recording to analyse and understand the observable co-teaching behaviours of teachers and students when co-taught.

9.6.3 Comparative Study

Similar studies could be conducted in other higher education establishments employing co-teaching to compare the results to gain a wider perspective. A comparative study could be carried out to compare solo and co-taught units to acquire a better understanding of the efficacy of this pedagogical strategy. As already mentioned in Chapter 1, HUMB1000 is an introductory semester one human anatomy and physiology unit implementing co-teaching. In Semester two, some of these students enrol into HUMB1001 unit, an advanced human anatomy and physiology unit, which is taught by a solo teacher. The mode of delivery is the same, an i-lecture followed by a face-to-face laboratory session. A longitudinal study comparing the different pedagogical approaches, co-teaching versus solo teaching, could provide a better understanding of co-teaching from both students' and teachers' perspective.

Future research is essential to understand the impact of co-teaching on learning gains of students by assessing students' academic achievements in co-taught classes as the ultimate goal of education is improve students' understanding and learning of educational content. Furthermore, to assess the effectiveness of co-teaching over solo teaching, student's cognitive outcomes could be examined. Since this was out of scope of this study, future research could compare students' achievement scores to address this aspect.

9.6.4 Extension Study

After evaluating the students' and co-teachers' responses and reviewing outcomes of this research study, I see potential in extending this research in different directions. Further investigation into co-teaching in higher education is strongly recommended. A number of future studies using the same investigative method are indicated.

More research is needed to better understand whether purposeful pairing and then granting enough time to develop teaching methodologies together creates a successful partnership. It would be interesting to explore if personality characteristics, abilities and academic competence and other beliefs influence successful co-teaching association.

Further work needs to be conducted to assess the impact of providing opportunities for professional development on co-teachers' perceptions and experiences of co-teaching. Identifying effective and non-effective co-teaching pairs and then providing professional development to observe any change in the behaviours would be fascinating.

9.6.5 Applications of the Outcomes of this Research Study

As the data were analysed and themes emerged, I realised the necessity of supporting co-teachers at Curtin University with crucial understanding of the philosophy of co-teaching, various strategies that could be implemented and approaches to resolve conflicts amicably. The majority of co-teaching academics were employed as sessional staff, as I have been, and, I was determined to empower them for better teaching experiences and professional development. On these grounds, the following projects and workshops were conducted to enhance co-teacher's teaching experiences informed by the current research study.

- In collaboration with another colleague, two co-facilitated workshops were run one at the faculty level and another at the university level to elucidate the underpinning philosophy of co-teaching and how it would appear in actual classroom. Also the challenges and conflicts experienced and reported by various

co-teachers in this research study were discussed and strategies suggested to address the issues. Both workshops were well received and appreciated by co-teachers.

- I also actively engaged with a colleague and secured a grant, Curtin University Teaching Excellence Development Fund (TEDF), for two consecutive years in 2015 and 2016. In first year, co-teachers were trained in effective co-teaching practices. Responding to the successful response of first year project, the second year project encouraged and developed scholarship of teaching in sessional staff through peer-review process while co-teaching which provided instant feedback for professional development. Both the projects were a success.
- To address the challenge of unfamiliarity with their co-teaching partner, I, along with a team of sessional co-teachers consulted the relevant literature and contextualised two resources namely SHARE worksheet (Murawski & Dieker,2004) and COGEN Tool that are currently being successfully used by interprofessional first year co-taught units with positive response from the peers. As a result of TEDF 2016 outcome, an online learning resource (video) for co-teaching was also created that would soon be used across the university.

I considered it my professional responsibility to share the findings with the broader teaching and learning research community and peers and thus build a Scholarship of Learning and Teaching. Therefore, I have been actively disseminating the information about co-teaching in higher education sector, both nationally and internationally at prestigious educational research conferences such as Australian Association for Research in Education Conference (AARE), American Educational Research Association Conference (AERA), Australasian Science Education Research Association Conference (ASERA), National Association for Research in Science Teaching Conference (NARST), Teaching & Learning Forum and University Students Transitions Achievement Retention Success (STARS) Conference. At the time of summarising this thesis, my proposal to present at European Science Education and Research Association (ESERA) has been accepted.

9.7 Summary and Concluding Remarks

As I concluded this research journey, it felt like an enlightening experience reflecting on co-teaching practice and student learning. A first of its kind, especially in Australian higher

education context, this study provided a comprehensive interpretation of students' and co-teachers' perceptions and experiences of co-teaching. The research findings suggest that in general co-teaching is a favoured pedagogical approach in Interprofessional units because the diversity of the teaching cohort is beneficial to student learning and experience.

One of the more significant findings to emerge from this study was identifying some weaknesses that diminish the effectiveness of this pedagogical approach. The need to provide sustainable training both in the pedagogy and transversal skills must certainly be considered. Careful attention needs to be paid to the pairing and mutual growth of co-teachers for positive teaching and learning experiences. This study can provide guidelines for policy makers and administrators to develop sustainable training programs and implement them accordingly.

The essential conclusion of this study is that co-teaching in higher education offers abundant promise but needs a strong foundation based on research to be delivered as an effective pedagogical approach. The process of learning requires awareness and focus to improve which needs to be supported by proper environment to learn and strategies that facilitate learning (Buckler, 1996; Crose, 2011). Schunk and Zimmerman (2012) emphasised the role of motivation in supporting self-regulated learning. Co-teaching exposure with peers leads to self-awareness and self-motivation to learn. As the co-teachers become aware and are open to independent learning, they develop reflective thinking and thus grow and develop as better teachers and co-teachers.

References

- Aldridge, J. M., Fraser, B. J., Bell, L., & Dorman, J. (2012). Using a new learning environment questionnaire for reflection in teacher action research. *Journal of Science Teacher Education, 23*(3), 259-290. doi: 10.1007/s10972-012-9268-1
- Andersen, L. R. (1991). Improve the quality of instruction through interdisciplinary internationally oriented faculty resource teams. Retrieved from <https://files.eric.ed.gov/fulltext/ED369309.pdf>
- Anderson, R. S., & Speck, B. W. (1998). Oh what a difference a team makes: Why team teaching makes a difference. *Teaching and Teacher Education, 14*(7), 671-686. Doi: 10.1016/S0742-051X(98)00021-3
- Andrews, J., & Higson, H. (2008). Graduate employability, 'soft skills' versus 'hard' business knowledge: A European study. *Higher Education in Europe, 33*(4), 411-422. doi: 10.1080/03797720802522627
- Austin, V. L. (2001). Teachers' beliefs about co-teaching. *Remedial and Special Education, 22*(4), 245-255. doi: 10.1177/074193250102200408
- Bacharach, N., Heck, T.W., & Dahlburg, K. (2008). Co-teaching in higher education. *Journal of College Teaching and Learning, 5*(3), 9-16. doi: 10.19030/tlc.v5i3.1298
- Bacharach, N., Heck, T. W. & Dahlberg, K. (2008). What makes co-teaching work? Identifying the essential elements. *College Teaching Methods & Styles 4*(3), 43-48. Retrieved from https://www.stcloudstate.edu/soe/coteaching/_files/documents/What_Makes_Co-Teaching_Work.pdf
- Bacharach, N., Heck, T. W., & Dahlberg, K. (2010). Changing the face of student teaching through coteaching. *Action in Teacher Education, 32*(1), 3-14. doi: 10.1080/01626620.2010.10463538
- Bacharach, N., Heck, T.W., & Dank, M. (2003). Co-teaching: A partnership in the classroom. Paper presented at the *Annual Meeting of the Association of Teacher Educators, Jacksonville, FL*.
- Baker, M. J., & Durham, C. F. (2013). Interprofessional education: A survey of students' collaborative competency outcomes. *Journal of Nursing Education, 52*(12), 713-718. doi: 10.3928/01484834-20131118-04

- Baltrinic, E.R., Jencius, M., & McGlothlin, J. (2016). Co-teaching in counselor education: Preparing doctoral students for future teaching. *Counselor Education & Supervision, 55*(1), 31-45. doi: 10.1002/ceas.12031
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215. doi: 10.1037/0033-295X.84.2.191
- Barr, H. (2009). Interprofessional education. In J. Dent & R. Harden (Eds.), *A practical guide for medical teachers* (4th ed., pp. 187-192). Edinburgh, UK: Elsevier Churchill Livingstone.
- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report, 13*(4), 544-559. Retrieved from <https://nsuworks.nova.edu/tqr/vol13/iss4/2>
- Beers, J. (2005). The role of coteaching in the development of the practices of an urban science teacher. In W. Roth & K. Tobin (Eds.), *Teaching together, learning together* (pp. 79-95). New York, NY: Peter Lang.
- Bess, J. L. (2000). Teaching alone, teaching together: Transforming the structure of teams for teaching. San Francisco, CA: Jossey-Bass Inc.
- Birrell, J. R., & Bullough Jr, R. V. (2005). Teaching with a peer: A follow-up study of the 1st year of teaching. *Action in Teacher Education, 27*(1), 72-81. doi: 10.1080/01626620.2005.10463375
- Blonstein, J., Gleason, S., Milne, C., & Scantlebury, K. (2011). Coteaching and disturbances: Building a better system for learning to teach science. *Research in Science Education, 41*(3), 413-440. doi: 10.1007/s11165-010-9172-7
- Bouck, E. C. (2007). Co-teaching...Not just a textbook term: Implications for practice. *Preventing School Failure: Alternative Education for Children and Youth, 51*(2), 46-51. doi: 10.3200/PSFL.51.2.46-51
- Boud, D. (2001). Making the move to peer learning. In Boud, D., Cohen, R. & Sampson, J. (Eds.) (2001). *Peer Learning in Higher Education: Learning from and with each other*. London, UK: Kogan Page (now Routledge), 1-20.
- Bourdieu, P. (1990). *The logic of practice*. Cambridge, UK: Polity Press.
- Bourdieu, P. (1992). The practice of reflexive sociology. In P. Bourdieu & L.J. Wacquant, *An invitation to reflexive sociology* (pp. 216-260). Cambridge, UK: Polity Press.
- Brancato, V. C. (2003). Professional development in higher education. *New Directions for Adult and Continuing Education, 2003* (98), 59-66. Retrieved from <https://onlinelibrary-wiley-com.dbgw.lis.curtin.edu.au/doi/abs/10.1002/ace.100>
- Brenan, C., & Witte, R. (2003). Team teaching in the secondary instrumental music classroom. *Music Educators Journal, 89*(3), 31-35. doi: 10.2307/3399855

- Brown, P. R., & Lint, P. E. (1982). Co-teaching: A key to auditing instruction. *Journal of Accountancy*, 154(3), 94-98. Retrieved from https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/206716122?rfr_id=info%3Axri%2Fsid%3Aprimio
- Brownell, M. T., Adams, A., Sindelar, P., Waldron, N., & Vanhover, S. (2006). Learning from collaboration: The role of teacher qualities. *Exceptional Children*, 72(2), 169-185. doi: 10.1177/001440290607200203
- Bryman, A. (2008). In-depth interview. In M. Lewis-Back, A. Bryan & T. Futing-Liao (Eds.), *The Sage encyclopedia of social science research methods* (2nd volume, pp. 485-485). Thousand Oaks, CA: Sage Publications.
- Buchanan, J., Prescott, A., Schuck, S., Aubusson, P., Burke, P., & Louviere, J. (2013). Teacher retention and attrition: Views of early career teachers. *Australian Journal of Teacher Education*, 38(3), 112-129. Retrieved from <http://dx.doi.org/10.14221/ajte.2013v38n3.9>
- Buckler, B. (1996). A learning process model to achieve continuous improvement and innovation. *The Learning Organization*, 3(3), 31-39. doi: 10.1108/09696479610119660
- Campbell, M. (2010). Collaborations between librarians and faculty in a digital age. *Education Digest*, 75(6), 30-33. Retrieved from https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/61797508?rfr_id=info%3Axri%2Fsid%3Aprimio
- Carlisle, K. (2010). Enactment of coteaching in primary schools: Moving towards a shared responsibility. In C. Murphy & K. Scantlebury (Ed.), *Coteaching in international contexts* (pp. 129-150). doi: 10.1007/978-90-481-3707-7
- Carpenter, D. M., Crawford, L., & Walden, R. (2007). Testing the efficacy of team teaching. *Learning Environments Research*, 10(1), 53-65. doi: 10.1007/s10984-007-9019-y
- Carroll, T. G., Fulton, K., & Doerr, H. (2010). Team up for 21st century teaching and learning: What research and practice reveal about professional learning. Condensed excerpts. Retrieved from <https://eric.ed.gov/?id=ED512177>
- Čepić, R., Vorkapić, S. T., Lončarić, D., Anđić, D., & Mihić, S. S. (2015). Considering transversal competences, personality and reputation in the context of the teachers' professional development. *International Education Studies*, 8(2), 8-20. doi:10.5539/ies.v8n2p8
- Chanmugam, A., & Geralch, B. (2013). A co-teaching model for developing future educators' teaching effectiveness. *International Journal of Teaching and Learning in Higher Education*, 25(1), 110-117. Retrieved from <http://www.isetl.org/ijtlhe/pdf/IJTLHE1412.pdf>
- Clancy, T. L., Rosenau, P., Ferreira, C., Lock, J., & Rainsbury, J. (2015). Modeling co-teaching to inform professional practice. In B. Preciado, M.A. Takeuchi & J. Lock (Eds.), *Proceedings of the IDEAS: Designing responsive pedagogy* (pp. 72-81). Retrieved from <http://dx.doi.org/10.11575/PRISM/5310>
- Clark, R., & Andrews, J. (2009). *Peer mentoring in higher education: A literature review*. Retrieved from: http://publications.aston.ac.uk/id/eprint/17985/1/Peer_mentoring_in_higher_education.pdf

- Clarke, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education, 18*(8), 947-967.
- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences*. Hillsdale, NJ: Erlbaum.
- Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159. doi: 10.1037/0033-2909.112.1.155
- Cohen, L., Manion, L., & Morrison, K. (2002). *Research methods in education*. New York, NY: Routledge.
- Cohen, L., Manion, L., & Morrison, K. (Eds.). (2011). *Research methods in education* (7th ed.). New York, NY: Routledge.
- Conderman, G. (2011). Middle school co-teaching: Effective practices and student reflections. *Middle School Journal, 42*(4), 24-31.
- Conderman, G. & McCarty, B. (2003). Shared insights from university co-teaching. *Academic Exchange Quarterly, 7*(4), 23-27.
- Conderman, G., Bresnahan, V., & Pedersen, T. (2009). *Purposeful co-teaching: real cases and effective strategies*. Thousand Oaks, CA: Corwin Press.
- Connolly, M. & James, C. (2006). Collaboration for school improvement: A resource dependency and institutional framework of analysis. *Educational Management Administration & Leadership, 34*(1), 69-87. doi: 10.1177/1741143206059540
- Cook, L. & Friend, M. (1995). Coteaching: Guidelines for creating effective practices. *Focus on Exceptional Children, 28*(3), 1-16. Retrieved from <https://eric.ed.gov/?id=EJ545936>
- Cook, L., & Friend, M. (2004, April 29). *Co-teaching: Principles, practices, and pragmatics*. Paper presented at the New Mexico Public Education Department Quarterly Special Education Meeting, Albuquerque, USA. Retrieved from <https://files.eric.ed.gov/fulltext/ED486454.pdf>
- Cooper, D. R., & Schindler, P. S. (Eds.). (2001). *Business research methods* (7th ed.). New York, NY: McGraw.
- Cox, B. J., & Ray, M. B. (1990). Getting Dorothy out of Kansas: The importance of an advanced component to legal writing programs. *Journal of Legal Education, 40*(3), 351-361. Retrieved from https://www.jstor.org/stable/42893168?seq=1#page_scan_tab_contents
- Creswell, J. W. (Ed.). (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Boston, MA: Pearson Education, Inc.
- Creswell, J. W. (Ed.). (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage Publications.
- Creswell, J. W., & Plano Clark, V. L. (2011). *Choosing a mixed methods design*. In J. W. Creswell & V.L. Plano Clark (Eds.), *Designing and conducting mixed methods research* (2nd ed.), (pp. 53-106). Los Angeles, CA: Sage Publications.

- Creswell, J., & Plano Clark, V. (2010). *Designing and conducting mixed methods research*. Los Angeles, CA: Sage Publications.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297-334.
- Croese, B. (2011). Internationalization of the higher education classroom: Strategies to facilitate intercultural learning and academic success. *International Journal of Teaching and Learning in Higher Education*, *23*(3), 388-395. Retrieved from <http://www.isetl.org/ijtlhe/pdf/IJTLHE1056.pdf>
- Crow, J., & Smith, L. (2003). Using co-teaching as a means of facilitating interprofessional collaboration in health and social care. *Journal of Interprofessional Care*, *17*(1), 45-55. doi: 10.1080/1356182021000044139
- Crow, J., & Smith, L. (2005). Co-teaching in higher education: Reflective conversation on shared experience as continued professional development for lecturers and health and social care students. *Reflective Practice*, *6*(4), 491-506. doi: 10.1080/14623940500300582
- Cushman, S. (2004). *What is co-teaching*. Retrieved from: https://www.corwin.com/sites/default/files/upm-binaries/26099_Villa_Guide_to_Co_Teaching_Chapter_1.pdf
- Darling-Hammond, L., & McLaughlin, M. W. (1995). Policies that support professional development in an era of reform. *Phi Delta Kappan*, *76*(8), 597-604. Retrieved from https://search-proquest-com.ez.library.latrobe.edu.au/docview/1301197616?rfr_id=info%3Aaxri%2Fsid%3Aprimo
- Darragh, J. J., Picanco, K. E., Tully, D., & Henning, A. S. (2011). When teachers collaborate, good things happen: Teacher candidate perspectives of the co-teach model for the student teaching internship. *Journal of the Association of Independent Liberal Arts Colleges of Teacher Education*, *8*(1), 83-109.
- Darwin, A., & Palmer, E. (2009). Mentoring circles in higher education. *Higher Education Research & Development*, *28*(2), 125-136. doi: 10.1080/07294360902725017
- Denzin, N. K., & Lincoln, Y. S. (2005). *The Sage handbook of qualitative research*. Thousand Oaks, CA: Sage Publications.
- DeVellis, R. F. (Ed.). (2003). *Scale development: Theory and applications* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- DeVellis, R. F. (Ed.). (2012). *Scale Development: Theory and Application* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Dieker, L. A. (2001). What are the characteristics of “effective” middle and high school co-taught teams for students with disabilities? *Preventing School Failure: Alternative Education for Children and Youth*, *46*(1), 14-23. doi: 10.1080/10459880109603339

- Dieker, L., & Little, M. (2005). Secondary reading: Not just for reading teachers anymore. *Intervention in School and Clinic, 40*(5), 276-283. doi: 10.1177/10534512050400050401
- Dieker, L. A., & Murawski, W. W. (2003). Co-teaching at the secondary level: Unique issues, current trends and suggestions for success. *The High School Journal, 86*(4), 1-13. Retrieved from https://www.cfn107.org/uploads/6/1/9/2/6192492/co-teaching_at_the_secondary_level.pdf
- Dorman, J.P. (2014). Classroom psychosocial environment and course experiences in pre-service teacher education courses at an Australian university. *Studies in Higher Education, 39*(1), 34-47. doi: 10.1080/03075079.2012.674936
- Downie, J. (2013). <http://www2.curtin.edu.au/learningfortomorrow/index.cfm>.
- Drewes, A. Scantlebury, K. Soslau, E. & Gallo Fox, J. (2016). *Evaluating coteaching as a model for pre-service teacher preparation: developing an instrument utilizing mixed methods*. Paper presented at American Education Research Association (AERA) Annual Meeting, Washington, D.C.
- Duckett, S. J. (2005). Health workforce design for the 21st century. *Australian Health Review, 29*(2), 201-210. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/15865571>
- Dugan, K. B., & Letterman, M. R. (2008). Student appraisals of collaborative teaching. *College Teaching, 56*(1), 11-15. doi: 10.3200/CTCH.56.1.11-16
- Duhe, S. (2009). What's your type? Using the Myers-Briggs personality inventory to improve team performance. *Communication Teacher, 23*(4), 142-147. doi: 10.1080/17404620903218775
- Dumas, L., & de Montigny, F. D. (1999). Quality perinatal nursing education through coteaching. *Innovative Service, 8*(4), 27-35. doi: 10.1624/105812499X87330
- Dunn, K. (2010). Interviewing. In I. Hay (Ed.), *Qualitative research methods in human geography* (pp. 101-138). New York, NY: Oxford University Press.
- Education for All Handicapped Children's Act 1975 (EHA), s.6.94. Retrieved from <https://www.govtrack.us/congress/bills/94/s6/summary>
- Elmore, R. F. (2004). *School reform from the inside out: Policy, practice and performance*. Cambridge, MA: Harvard University Press.
- Feldman, A., Altrichter, H., Posch, P., & Somekh, B. (Eds.). (2018). *Teachers investigate their work: An introduction to action research across the professions* (3rd ed.). London, UK: Routledge.
- Ferguson, J., & Wilson, J. C. (2011). The co-teaching professorship: power and expertise in the co-taught higher education classroom. *Scholar-Practitioner Quarterly, 5*(1), 52-68. Retrieved from <https://files.eric.ed.gov/fulltext/EJ942564.pdf>
- Fisher, D. L., & Fraser, B. J. (1981). Validity and use of the My Class Inventory. *Science Education, 65*(2), 145-156. doi: 10.1002/sce.3730650206

- Fisher, D. L., Fraser, B. J., & Wubbels, T. (1993). Interpersonal teacher behaviour and school climate. In T. Wubbels & J. Levy (Eds.), *Do you know what you look like? Interpersonal relationships in education* (pp. 103-112). London, UK: The Falmer Press.
- Fleming, P. A. (2007). *Successful co-teaching relationships: a qualitative study on what it takes to forge a successful working relationship* (unpublished Doctoral dissertation), Marietta College, OH. Retrieved from https://etd.ohiolink.edu/pg_10?0::NO:10:P10_ACCESSION_NUM:marietta1176905438
- Fraser, B.J. (2012) Classroom learning environments: Retrospect, context and prospect. In B.J. Fraser, K.G. Tobin & C.J. McRobbie CJ (Eds). *Second international handbook of science education* (pp.1191-1239). New York, NY: Springer.
- Fraser, B. J. (1998). Classroom environment instruments: Development, validity and applications. *Learning Environments Research*, 1(1), 7-34. Retrieved from <https://link.springer.com/article/10.1023/A:1009932514731>
- Fraser, B. J., Anderson, G. J., & Walberg, H. J. (Eds.). (1982). *Assessment of learning environments: Manual for Learning Environment Inventory (LEI) and My Class Inventory (MCI)* (3rd Ed.). Perth, Australia: Western Australian Institute of Technology.
- Fraser, B. J., Giddings, G. J., & McRobbie, C. J. (1995). Evolution and validation of a personal form of an instrument for assessing science laboratory classroom environments. *Journal of Research in Science Teaching*, 32(4), 399-422. doi: 10.1002/tea.3660320408
- Fraser, B. J. & Treagust, D. F. (1986). Validity and use of an instrument for assessing classroom psychosocial environment in higher education. *Higher Education*, 15, 37-57.
- Fraser, B. J., Treagust, D. F., & Dennis, N. C. (1986). Development of an instrument for assessing classroom psychosocial environment at universities and colleges. *Studies in Higher Education*, 11(1), 43-54. doi:10.1080/03075078612331378451
- Friedel, J. M., & Treagust, D. F. (2005). Learning bioscience in nursing education: Perceptions of the intended and the prescribed curriculum. *Learning in Health and Social Care*, 4(4), 203-216.
- Friend, M. (2000). Myths and misunderstandings about professional collaboration. *Remedial and Special Education*, 21(3), 130-132. doi: 10.1177/074193250002100301
- Friend, M. (2008). Co-teaching: A simple solution that isn't simple after all. *Journal of Curriculum and Instruction*, 2(2), 9-19. doi: 10.3776/joci.2008.v2n2p9-19
- Friend, M. (2011). *Special education: Contemporary perspectives for school professionals*. Upper Saddle River, NJ: Pearson Education.
- Friend, M. (2014). *Co-teaching: Strategies to improve student outcomes* [Laminated Brochure]. Retrieved from <https://www.nprinc.com/co-teaching-strategies-to-improve-student-outcomes/>
- Friend, M., & Bursuck, W. D. (2009). *Including students with special needs: A practical guide for classroom teachers* (5th ed.). Upper Saddle River, NJ: Pearson Education.

- Friend, M., & Cook, L. (Eds.). (2007). *Co-teaching interactions: Collaboration skills for professionals* (5th ed.). Boston, MA: Pearson Education.
- Friend, M., Cook, L., Hurley-Chamberlain, D., & Shamberger, C. (2010). Co-teaching: An illustration of the complexity of collaboration in special education. *Journal of Educational and Psychological Consultation* 20(1), 9-27. doi: 10.1080/10474410903535380
- Friend, M., Reising, M., & Cook, L. (1993). Co-teaching: An overview of the past, a glimpse at the present, and considerations for the future. *Preventing School Failure: Alternative Education for Children and Youth* 37(4), 6-10. doi: 10.1080/1045988X.1993.9944611
- Gable, R. A., Arllen, N. L., & Cook, L. (1993). But let's not overlook the ethics of collaboration. *Preventing School Failure: Alternative Education for Children and Youth*, 37(4), 32-36. doi: 10.1080/1045988X.1993.9944616
- Gallego, M. A. (2001). Is experience the best teacher? The potential of coupling classroom and community-based field experiences. *Journal of Teacher Education*, 52(4), 312-325. doi: 10.1177/0022487101052004005
- Gallo-Fox, J. (2009). *Learning to teach in a coteaching community of practice* [Unpublished Doctoral Dissertation]. Retrieved from <https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/304830457?pq-origsite=primo>
- Gallo-Fox, J. (2010). Risk-taking as practice in a coteaching professional learning community. In C. Murphy & K. Scantlebury (Eds.), *Coteaching in international contexts: Moving forward and broadening perspectives* (pp.105-124). Dordrecht, The Netherlands: Springer Publishing.
- Gallo-Fox, J., & Scantlebury, K. (2016). Coteaching as professional development for cooperating teachers. *Teaching and Teacher Education*, 60, 191-202. doi: 10.1016/j.tate.2016.08.007
- Gallo-Fox, J., & Scantlebury, K. (2015). It isn't necessarily sunshine and daisies every time: coplanning opportunities and challenges when student teaching. *Asia-Pacific Journal of Teacher Education*, 43(4), 324-337. doi:10.1080/1359866X.2015.1060294
- Gallo-Fox, J., Wassell, B., Scantlebury, K., & Juck, M. (2006). Warts and all: Ethical dilemmas in implementing the coteaching model. *Forum: Qualitative Social Research*, 7(4), 1-16. Retrieved from <https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/869232237/abstract/104826BC9A84655PQ/1?acountid=10382>
- Gately, S. E. (2005). Two are better than one. *Principal Leadership*, 5(9), 36-41. Retrieved from <https://eric.ed.gov/?id=EJ766923>
- Gately, S. E., & Gately, F. J. (2001). Understanding coteaching components. *Teaching Exceptional Children*, 33(4), 40-47. Retrieved from https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/201082698?rfr_id=info%3Axi%2Fsid%3Aprimo
- Gaytan, J. (2010). Instructional strategies to accommodate a team-teaching approach. *Business Communication Quarterly*, 73(1), 82-87. doi: 10.1177/1080569909358097

- George, D., & Mallery, P. (Eds.). (2010). *SPSS for Windows step by step: A simple guide and reference, 17.0 update* (10th ed.). Boston, MA: Allyn & Bacon.
- Gillespie, D., & Israel, A. (2008, August). *Benefits of Co-Teaching in Relation to Student Learning*. Paper presented at the 116th Annual Meeting of the American Psychological Association, Boston, Massachusetts. Retrieved from <https://files.eric.ed.gov/fulltext/ED502754.pdf>
- Good, K., Davis, R. S., Maguire, T., & Roehl, J. (2014). Co-teaching: From K-12 teaching to teaching in higher ed. *National Social Science Journal, 41*(2), 30-35.
- Graziano, K. J., & Navarrete, L. A. (2012). Co-teaching in a teacher education classroom: Collaboration, compromise, and creativity. *Issues in Teacher Education, 21*(1), 109-126. Retrieved from <https://eric.ed.gov/?id=EJ986819>
- Greene, M.S., & Issacs, M.L. (1999). The responsibility of modelling collaboration in the university education classroom. *Action in Teacher Education, 20*(1), 98-106. doi: 10.1080/01626620.1998.10462909
- Guba, E. G., & Lincoln, Y. S. (1981). *Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches*. San Francisco, CA: Jossey-Bass.
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (2nd ed., pp. 163-194). Thousand Oaks, CA: Sage Publications.
- Guise, M., Habib, M., Thiessen, K., & Robbins, A. (2017). Continuum of co-teaching implementation: Moving from traditional student teaching to co-teaching. *Teaching and Teacher Education, 66*, 370–382. Retrieved from <http://doi.org/10.1016/j.tate.2017.05.002>
- Hassel, E. (1999). *Professional development: Learning from the best*. Oak Brook, IL: North Central Regional Educational Laboratory.
- Hazelkorn, E. (2013). How rankings are reshaping higher education. In V. Climent, F. Michavila & M. Ripolles, (Eds.), *Los Rankings Univeritarios. Mitos y Realidades* (pp. 1-8). Retrieved from <https://arrow.dit.ie/cgi/viewcontent.cgi?article=1023&context=cserbk>
- Hean, S., Craddock, D., & Hammick, M. (2012). Theoretical insights into inter-professional education. *Medical Teacher, 34*(2), 158-160. doi:10.3109/0142159X.2012.643263
- Henderson, D., Fisher, D., & Fraser, B. (2000). Interpersonal behavior, laboratory learning environments, and student outcomes in senior biology classes. *Journal of Research in Science Teaching, 37*(1), 26-43.
- Hirsh, S. (2006). Assessment inventory measures professional development quality. *National Staff Development Council, 27*(2), 63-64. Retrieved from https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/211509041?rfr_id=info%3Axri%2Fsid%3Aprimo
- Hitchcock, G., & Hughes, D. (Eds.). (1995). *Research and the teacher: A qualitative introduction to school-based research* (2nd ed.). London, UK: Routledge.

- Hohenbrink, J., Johnston, M., & Westhoven, L. (1997). Collaborative teaching of a social studies methods course: Intimidation and change. *Journal of Teacher Education*, 48(4), 293-300. doi: 10.1177/0022487197048004007
- Hohn, J. L. (2010). *The impact of training on coteacher collegiality and relationships* [unpublished Doctoral Dissertation]. Retrieved from <https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/89172914?pq-origsite=primo>
- Hourcade, J. J., & Bauwens, J. (2003). *Cooperative teaching: Rebuilding and sharing the schoolhouse*. Austin, TX: Pro-Ed.
- Howard, L., & Potts, E. A. (2009). Using co-planning time: strategies for a successful co-teaching marriage. *Teaching Exceptional Children Plus*, 5(4). Retrieved from <https://files.eric.ed.gov/fulltext/EJ967747.pdf>
- Hwang, Y. S., Hernandez, J., & Vrongistions, K. (2002). Elementary teacher education students' perceptions of team teaching. *Education*, 123(2), 246-254. Retrieved from <http://go.galegroup.com.ez.library.latrobe.edu.au/ps/i.do?id=GALE%7CA98248720&v=2.1&u=latrobe&it=r&p=EAIM&sw=w>
- Individuals with Disabilities Education Improvement Act 2004 (IDEA). Retrieved from <https://sites.ed.gov/idea/>
- Ivanov, M., & Werner, P.D. (2010). Behavioral communication: Individual differences in communication style. *Personality and Individual Differences*, 49(1), 19-23. doi: 10.1016/j.paid.2010.02.033
- Jaeger, R.M. (1997). Survey research methods in education. In R.M. Jaeger (Ed.), *Complementary methods of research in education* (2nd ed., pp. 449-476). Washington, DC: American Educational Research Association.
- Jegade, O., Fraser, B. J., & Fisher, D. L. (1998, April 13-17). *Development, validation and use of a learning environment instrument for university distance education settings*. Paper presented at Annual Meeting of the American Educational Research Association, San Diego, CA.
- Johnson, B., & Christensen, L. (Eds.). (2008). *Educational research: Quantitative, qualitative, and mixed approaches* (4th ed.). Los Angeles, CA: Sage Publications.
- Johnson, W. B. (2006). *On being a mentor: A guide for higher education faculty*. Mahwah, NJ: Lawrence Erlbaum.
- Jones, F., & Harris, S. (2012). Benefits and drawbacks of using multiple instructors to teach single courses. *College Teaching*, 60(4), 132-139. doi: 10.1080/87567555.2012.654832
- Kahu, E. R. (2013). Framing student engagement in higher education. *Studies in Higher Education*, 38(5), 758-773. doi: 10.1080/03075079.2011.598505
- Karten, T.J. (2005). *Inclusion strategies that work*. Thousand Oaks, CA: Corwin Press. Kerridge, J., Kyle, G., & Marks-Maran, D. (2009). Evaluation of the use of team teaching for delivering sensitive content – a pilot study. *Journal of Further and Higher Education*, 33(2), 93-103. doi: 10.1080/03098770902856637

- King, A. (1993). From sage on the stage to guide on the side. *College Teaching*, 41(1), 30-35. doi: 10.1080/87567555.1993.9926781
- Kliegl, J.A., & Weaver, K.D. (2014). Teaching teamwork through coteaching in business classroom. *Business and Professional Communication Quarterly*, 77(2), 204-216. doi:10.1177/1080569913507596.
- Kloo, A., & Zigmond, N. (2008). Coteaching revisited: redrawing the blueprint. *Preventing School Failure* 52(2), 12-20. doi: 10.3200/PSFL.52.2.12-20
- Kluth, P., & Straut, D. (2003). Do as we say and as we do. *Journal of Teacher Education*, 54(3), 228-240. doi:10.1177/0022487103054003005
- Kohler-Evans, P. A. (2006). Co-teaching: How to make this marriage work in front of the kids. *Education*, 127(2), 260-264. Retrieved from <https://eric.ed.gov/?id=EJ765824>
- La Haye, R., & Naested, I. (2014). Mutual interrogation: A celebration of alternate perspectives for visual art and math curriculum. *Canadian Review of Art Education: Research & Issues*, 41(2), 185-201. Retrieved from <http://web.a.ebscohost.com.ez.library.latrobe.edu.au/ehost/detail/detail?vid=0&sid=7c48e089-43a9-4788-8edb-8c681c626a8%40sessionmgr4010&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZSZzY29wZT1zaXRl#AN=101101124&db=asu>
- Land, R., & Gordon, G. (2015). Teaching excellence initiatives: Modalities and operational factors. York, UK: Higher Education Academy.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: University of Cambridge Press.
- Le Cornu, R., & Ewing, R. (2008). Reconceptualising professional experiences in pre-service teacher education... reconstructing the past to embrace the future. *Teaching and Teacher Education*, 24(7), 1799-1812.
- Letterman, M. R., & Dugan, K. B. (2004). Team teaching a cross-disciplinary honors course: Preparation and development. *College Teaching*, 52(2), 76-79. Retrieved from https://poorvucenter.yale.edu/sites/default/files/basic-page-supplementary-materials-files/team_teaching.pdf
- Liu, J., & Pearson, D. (1999). Teachers' attitude toward inclusion and perceived professional needs for an inclusive classroom. Washington, DC: ERIC Clearinghouse.
- Lizzio, A., Wilson, K., & Simons, R. (2002). University students' perceptions of the learning environment and academic outcomes: implications for theory and practice. *Studies in Higher Education*, 27(1), 27-52. doi:10.1080/03075070120099359
- Lunenberg, M., Dengerink, J., & Korthagen, F. (2014). The professional teacher educator: Roles, behaviour, and professional development of teacher educators. Springer Science & Business Media.

- Lusk, M. E., Sayman, D., Zolkoski, S., Carrero, K., & Chui, C. L. (2016). Playing well with others: co-teaching in higher education. *The Journal of the Effective Schools Project*, 23, 52-61. Retrieved from <http://journals.sfu.ca/jesp/index.php/jesp/article/view/33/39>
- Mackenzie, N., & Knipe, S. (2006). Research dilemmas: Paradigms, methods and methodology. *Issues in Educational Research*, 16(2), 193-205. Retrieved from <http://www.iier.org.au/iier16/mackenzie.html>
- Martin, S. N. (2009). Learning to teach science. In *The World of Science Education* (pp. 567- 586). Brill Sense.
- Mastropieri, M. A., Scruggs, T. E., Graetz, J., Norland, J., Gardizi, W., & McDuffie, K.A. (2005). Case studies in co-teaching in the content areas: successes, failures, and challenges. *Intervention in School and Clinic*, 40(5), 260. doi: 10.1177/10534512050400050201
- Matthews, L. R., Pockett, R. B., Nisbet, G., Thistlethwaite, J. E., Dunston, R., Lee, A., & White, J. F. (2011). Building capacity in Australian interprofessional health education: perspectives from key health and higher education stakeholders. *Australian Health Review*, 35(2), 136-140. doi: 10.1071/AH10886
- Maxwell, T. I. M. (2006). Researching into some primary school children's views about school: Using personal construct psychology in practice with children on the special needs register. *Pastoral Care in Education*, 24(1), 20-26. doi: 10.1111/j.1468-0122.2006.00357.x
- McCormick, L., Noonan, M. J., Ogata, V., & Heck, R. (2001). Co-teacher relationship and program quality: Implications for preparing teachers for inclusive preschool settings. *Education and Training in Mental Retardation and Developmental Disabilities*, 36(2), 119-132/ Retrieved from https://www.jstor.org/stable/23879728?seq=1#page_scan_tab_contents
- McCoyd, J. L., & Kerson, T. S. (2006) Conducting intensive interviews using email: A serendipitous comparative opportunity. *Qualitative Social Work*, 5(3), 389-406. doi: 10.1177/1473325006067367
- McKenna, A. F., Yalvac, B., & Light, G. J. (2009). The role of collaborative reflection on shaping engineering faculty teaching approaches. *Journal of Engineering Education*, 98(1), 17-26. doi: 10.1002/j.2168-9830.2009.tb01002.x
- Mears, C. L. (2012). In-depth interviews. In J. Arthur, M. Waring, R. Coe & L. V. Hedges (Eds.), *Research methods and methodologies in education* (2nd ed., pp. 170-176). London, UK: Sage Publications.
- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.
- Metcalf, B., & Linstead, A. (2003). Gendering teamwork: Re-writing the feminine. *Gender, Work and Organization*, 10(1), 95–115. doi: 10.1111/1468-0432.00005
- Milne, C., Scantlebury, K., Blonstein, J., & Gleason, S. (2011). Coteaching and disturbances: Building a better system for learning to teach science. *Research in Science Education*, 41(3), 413-440. doi: 10.1007/s11165-010-9172-7

- Minnett, A. (1998). Two-teacher teaming in elementary classrooms: A pilot study. *National Association of Laboratory Schools Journal*, 22, 9-11.
- Mislang, J. (2011). *The experiences of undergraduate nursing students enrolled in a team teaching curriculum* (unpublished Master's Thesis). University of British Columbia, Vancouver, BC. Retrieved from <https://open.library.ubc.ca/cIRcle/collections/ubctheses/24/items/1.0072297>
- Moos, R. H., & Trickett, E. J. (1974). *Classroom environment scale manual*. Palo Alto, CA: Consulting Psychologists Press.
- Mullen, C. (2008). *The handbook of formal mentoring in higher education: A case study approach*. Norwood, MA: Christopher-Gordon Publishers.
- Murawski, W. W. (2003). *Co-teaching in the inclusive classroom: Working together to help all your students find success*. Medina, WA: Institute for Educational Development.
- Murawski, W.W. (2002). Demystifying co-teaching. *The CARS+ Newsletter*, 22(3), 17-19.
- Murawski, W. W. (2009). *Collaborative teaching in secondary schools: Making the co-teaching marriage work!* Thousand Oaks, CA: Corwin Press.
- Murawski, W. W., & Dieker, L. A. (2004). Tips and strategies for co-teaching at the secondary level. *Teaching Exceptional Children*, 36(5), 52–58. doi: 10.1177/004005990403600507
- Murawski, W. W., & Dieker, L. (2008). 50 ways to keep your co-teacher: Strategies for before, during and after co-teaching. *Teaching Exceptional Children*, 40(4), 40-48. doi: 10.1177/004005990804000405
- Murawski, W., & Dieker, L. (2013). *Leading the co-teaching dance: Leadership strategies to enhance team outcomes*. Arlington, VA: Council for Exceptional Children.
- Murawski, W. W., & Hughes, C. E. (2009). Response to intervention, collaboration, and co-teaching: A logical combination for successful systemic change. *Preventing School Failure: Alternative Education for Children and Youth*, 53(4), 267-277. doi: 10.3200/PSFL.53.4.267-277
- Murawski, W. W., & Swanson, H. L. (2001). A meta-analysis of co-teaching: Where are the data? *Remedial and Special Education*, 22(5), 258-267. Retrieved from https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/236257688?rfr_id=info%3Axri%2Fsid%3Aprimo
- Murphy, C., & Beggs, J. (2010). A five-year systematic study of coteaching science in 120 primary schools. In C. Murphy & K. Scantlebury (Eds.), *Coteaching in international contexts* (pp. 11-34). doi: 10.1007/978-90-481-3707-7
- Murphy, C., & Beggs, J. (2006). Addressing ethical dilemmas in implementing coteaching. *Forum Qualitative Social Research*, 7(4). Retrieved from <https://doaj.org/article/ced9254c688941db93a8f245e146df50>
- Murphy, C., & Beggs, J. (2005). Coteaching as an approach to enhance science learning and teaching in primary schools. In W.M. Roth & K. Tobin (Eds.), *Teaching together, learning together* (pp. 207-231). New York, NY: Peter Lang.

- Murphy, C. & Martin, S.N. (2015). Coteaching in teacher education: research and practice. *Asia-Pacific Journal of Teacher Education*, 43(4), 277-280. DOI: 10.1080/1359866X.2015.1060927
- Murphy, C. & Scantlebury, K. (2010). Introduction to Coteaching. In C. Murphy & K.Scantlebury (Ed.), *Coteaching in international contexts* (pp. 129-150). doi:10.1007/978-90-481-3707-7
- Murphy, C., Scantlebury, K., & Milne, C. (2015). Using Vygotsky's zone of proximal development to propose and test an explanatory model for conceptualising coteaching in pre-service science teacher education. *Asia-Pacific Journal of Teacher Education*, 43(4), 281-295.
- Nancarrow, S. A., Booth, A., Ariss, S., Smith, T., Enderby, P., & Roots, A. (2013). Ten principles of good interdisciplinary team work. *Human Resources for Health*, 11(19). doi: 10.1186/1478-4491-11-19
- Nierengarten, G. (2013). Supporting co-teaching teams in high schools: twenty research-based practices. *American Secondary Education*, 42(1), 73-83. Retrieved from https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/1509085614?rfr_id=info%3Aaxri%2Fsid%3Aprimo
- Nierengarten, G. M., Hughes, T., & Nierengarten, G. M. (2010). What teachers wish administrators knew about co-teaching in high schools. *Journal for Inclusive Education*, 2(6), 1-20. Retrieved from <https://corescholar.libraries.wright.edu/cgi/viewcontent.cgi?article=1122&context=ejie>
- Nisbet, J., & Watt, J. (1984). Chapter 5. In J. Bell (Ed.), *Conducting small scale investigations in educational management* (pp. 55-69). London, UK: Harper & Row.
- No Child Left Behind Act of 2001, P.L. 107-110, 20 U.S.C. § 6319 (2002).
- Noddings, N. (2004). Learning from our students. *Kappa Delta Pi*, 40(4), 154-159. doi: 10.1080/00228958.2004.10516427
- Noonan, M. J., McCormick, L., & Heck, R. H. (2003). The co-teacher relationship scale: Applications for professional development. *Education and Training in Developmental Disabilities*, 38(1), 113-120. Retrieved from <https://www.cliu.org/cms/lib/PA06001162/centricity/domain/26/documents/Noonanetal2003.pdf>
- Norris, D. M. (1997). Teachers' perceptions of co-teaching in an inclusive middle school: A look at general and special education teachers working together with students with learning disabilities (unpublished Doctoral Dissertation). George Mason University, Fairfax, VA. Retrieved from <https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/304404650/?pq-origsite=primo>
- Ó Conaill, N. (2010). A learning space: Student teachers experience of coteaching science. In C. Murphy, & K. Scantlebury (Eds.), *Coteaching in international contexts: Research and practice* (pp. 173-197). doi: 10.1007/978-90-481-3707-7

- Murawski, W., & Nussli, N. (2017). An international immersion into co-teaching: A wake-up call for teacher candidates in general and special education. *The Journal of Special Education Apprenticeship*, 6(1), 1-20. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1149569.pdf>
- Orlander, J.D., Gupta, M., Fincke, B.G., Maning, M.E. & Hershman, W. (2000). Co-teaching: A faculty development strategy. *Medical Education*, 34(4), 257-265. doi: 10.1046/j.1365-2923.2000.00494.x
- Ozkan, B. C. (2004). Using NVivo to analyze qualitative classroom data on constructivist learning environments. *The Qualitative Report*, 9(4), 589-603. Retrieved from <https://nsuworks.nova.edu/tqr/vol9/iss4/2/>
- Palmer, P. J. (2007). *The courage to teach: Exploring the inner landscape of a teacher's life*. San Francisco, CA: Jossey-Bass.
- Pancsofar, N., & Petroff, J. G. (2013). Professional development experiences in co-teaching: Associations with teacher confidence, interests, and attitudes. *Teacher Education and Special Education*, 36(2), 83-96. doi: 10.1177/0888406412474996
- Patel, N. H., & Herick, D. (2010). Collaborating in higher education: Improving pedagogical practice. *Scholarly Partnerships Education*, 5(2), 1-12. Retrieved from <https://pdfs.semanticscholar.org/ac03/41d2349b2432708ca1d30c5af24ec66d354a.pdf>
- Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage Publications.
- Paulsen, K. J. (2008). School-based collaboration: An introduction to the collaboration column. *Intervention in School and Clinic*, 43(5), 313-315. doi: 10.1177/1053451208314494
- Pimparyon, S. M., Caleer, S., Pemba, S., & Roff, P. (2000). Educational environment, student approaches to learning and academic achievement in a Thai nursing school. *Medical Teacher*, 22(4), 359-364. doi: 10.1080/014215900409456
- Ploessl, D. M., Rock, M. L., Schoenfeld, N., & Brooke, B. (2010). On the same page: practical techniques to enhance co-teaching interactions. *Intervention in School and Clinic*, 45(3), 158-168. doi: 10.1177/1053451209349529
- Plotnicov, L. (1985). Introducing contemporary anthropology: A team-taught course for large classes. *Anthropology & Education Quarterly*, 16(4), 256-260.
- Pratt, S. (2014). Achieving symbiosis: Working through challenges found in co-teaching to achieve effective co-teaching relationships. *Teaching and Teacher Education*, 41, 1-12. doi: 10.1016/j.tate.2014.02.006
- Rabidoux, S., & Rottmann, A. (2017). Escaping burnout through collaboration: Co-teaching in a right-to-work state. *Liberal Education*, 103(1), 58-60. Retrieved from https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/1879591680?rfr_id=info%3Axri%2Fsid%3Apmo
- Rahmawati, Y., Koul, R., & Fisher, D. (2015). Teacher–student dialogue: transforming teacher interpersonal behaviour and pedagogical praxis through co-teaching and co-generative

dialogue. *Learning Environments Research*, 18(3), 393–408. <http://doi.org/10.1007/s10984-015-9191-4>

- Rahmawati, Y., & Taylor, P. C. (2015). Moments of critical realisation and appreciation: A transformative chemistry teacher reflects. *Reflective Practice*, 16(1), 31-42. doi: 10.1080/14623943.2014.944142
- Rea, P. J., & Connell, J. (2005). Minding the fine points of co-teaching. *The Education Digest*, 71(1), 29-35. Retrieved from <https://eric.ed.gov/?id=EJ741100>
- Rehmeyer, J. (2008). *Collaborating to teach teachers: Mathematics & educators team up*. Berkeley, CA: Mathematical Sciences Research Institute.
- Reinbiller, N. (1996). Coteaching: New variations on a not-so-new practice. *Teacher Education and Special Education*, 19(1), 34-48. doi: 10.1177/088840649601900104
- Reynolds, M. L. (2010). *A multiple case study of the co-teaching practices of trained educators in two successful schools* (unpublished Doctoral Dissertation). Georgia Southern University, Statesboro, GA. Retrieved from <https://digitalcommons.georgiasouthern.edu/etd/419/>
- Rivera Torres, P., Lado Couste, N. R., & Cardone Riportella, C. (2001). Measurement and effects of teaching quality: an empirical model applied to masters programs. *Business Economic Series*, 10, 1-28. Retrieved from <https://e-archivo.uc3m.es/bitstream/handle/10016/62/wb013110.pdf?sequence=1>
- Robson, C. (Ed.). (2002). *Real world research (2nd ed.)*. London, UK: Blackwell.
- Ronfeldt, M., Farmer, S. O., McQueen, K., & Grissom, J. A. (2015). Teacher collaboration in instructional teams and student achievement. *American Educational Research Journal*, 52(3), 475-514. Retrieved from <https://www.jstor.org/stable/24546739>
- Roth, W.M. (1998). Science teaching as knowledgeability - A case study of knowing and learning during coteaching. *Science Education*, 82(3), 357-377. Retrieved from [https://doi-org.dbgw.lis.curtin.edu.au/10.1002/\(SICI\)1098-237X\(199806\)82:3<357::AID-SCE4>3.0.CO;2-B](https://doi-org.dbgw.lis.curtin.edu.au/10.1002/(SICI)1098-237X(199806)82:3<357::AID-SCE4>3.0.CO;2-B)
- Roth, W.M., Lawless, D., & Tobin, K. (2000). Towards praxeology of teaching. *Canadian Journal of Education*, 25(1), 1-15. Retrieved from <http://web.uvic.ca/~mroth/PREPRINTS/05Rothpg.pdf>
- Roth, W.M., Masciotra, D., & Boyd, N. (1999). Becoming in the classroom: A case study of teacher development through co-teaching. *Teaching and Teacher Education*, 15(7), 771-784. doi: 10.1016/S0742-051X(99)00027-X
- Roth, W. M., & Tobin, K. (2004). Co-generative dialoguing and metaloguing: Reflexivity of processes and genres. *Forum: Qualitative Social Research*, 5(3). Retrieved from https://search-proquest-com.dbgw.lis.curtin.edu.au/docview/869226905?rfr_id=info%3Axi%2Fsid%3Aprimo

- Roth, W. M., & Tobin, K. (2006). Announcing cultural studies of science education. *Cultural Studies of Science Education*, 1(1), 1-5. Retrieved from <https://link.springer.com/article/10.1007%2Fs11422-005-9005-6>
- Roth, W.M., & Tobin, K. (2005). *Teaching together, learning together*. New York, NY: Peter Lang.
- Roth, W.M., & Tobin, K. (2002). *At the elbow of another: Learning to teach by coteaching*. New York, NY: Peter Lang.
- Roth, W.M., & Tobin, K. (2007). Coteaching: From praxis to theory. *Teachers and teaching*, 10(2), 161-179. doi: 10.1080/0954025032000188017
- Roth, W. M., Tobin, K., Carambo, C., & Dalland, C. (2004). Coteaching: Creating resources for learning and learning to teach chemistry in urban high schools. *Journal of Research in Science Teaching*, 41(9), 882-904. doi: 10.1002/tea.20030
- Rushton, S., Morgan, J., & Richard, M. (2007). Teachers' Myers-Briggs personality profiles: Identifying effective teacher personality traits. *Teaching and Teacher Education*, 23(4), 432-441. doi: 10.1016/j.tate.2006.12.011
- Rytivaara, A., & Kershner, R. (2012). Co-teaching as a context for teachers' professional learning and joint knowledge construction. *Teaching and Teacher Education*, 28(7), 999-1008. doi: 10.1016/j.tate.2012.05.006
- Rytivaara, A., Pulkkinen, J., & de Bruin, C. L. (2019). Committing, engaging and negotiating: Teachers' stories about creating shared spaces for co-teaching. *Teaching and Teacher Education*, 83, 225-235.
- Sá, M., & Serpa, S. (2018). Transversal competences: Their importance and learning processes by higher education students. *Education Sciences*, 8(3), 126. doi 10.3390/educsci8030126
- Salkind, N. (2010). Convenience sampling. *Encyclopaedia Research Design*, 1, 254. Thousand Oaks, CA: SAGE Reference.
- Scantlebury, K., Gallo-Fox, J., & Wassell, B. (2008). Coteaching as a model for preservice secondary science teacher education. *Teaching and Teacher Education* 24(4), 967-981. doi: 10.1016/j.tate.2007.10.008
- Schulz, B. (2008). The importance of soft skills: Education beyond academic knowledge. *NWA Journal of Language & Communication*, 2(1). 146-15. Retrieved from <https://pdfs.semanticscholar.org/c1d3/e21ea8496e2d828678cde2981aac1bd4ce3e.pdf>
- Schunk, D. H., & Zimmerman, B. J. (2012). Motivation an essential dimension of self- regulated learning. In D. H. Schnuk & B.J. Zimmerman (Eds.), *Motivation and self- regulated learning* (pp. 13-42). Hoboken, CA: Taylor and Francis.
- Scruggs, T. E., Mastropieri, M. A., & McDuffie, K.A. (2007). Co-teaching in inclusive classrooms: A metasynthesis of qualitative research. *Exceptional Children*, 73(4), 392-416. doi: 10.1177/001440290707300401

- Shah, M., Lewis, I., & Fitzgerald, R. (2011). The renewal of quality assurance in Australian higher education: the challenge of balancing academic rigour, equity and quality outcomes. *Quality in Higher Education* 17(3), 265-278. doi: 10.1080/13538322.2011.614474
- Sheldon, A. E. (2012). *Co-teaching in an institute of higher education: A case study of a special education literacy course co-taught by a special education faculty member and an elementary education faculty member*. (unpublished Doctoral Dissertation), California State University, Northridge, CA. Retrieved from <http://scholarworks.csun.edu/handle/10211.2/1997>
- Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4-14. Retrieved from https://www-jstor-org.dbgw.lis.curtin.edu.au/stable/1175860?seq=1#metadata_info_tab_contents
- Simpson, J. F., Thurston, R. J., & James, L. E. (2012). Exploring personality difference of teachers co-teaching. *Journal of Instructional Psychology*, 41(1-4), 100–105. Retrieved from <http://web.a.ebscohost.com/abstract?site=ehost&scope=site&jrnl=00941956&AN=102742810&h=aJ7Jn2mdb3fOhULRtzLhkohmpfhHl3HRd5TnV5JPIWONLaFSPXztt12iHgUUw%2bXCiO56icCO6B5tDrMcMpKgrw%3d%3d&crl=c&resultLocal=ErrCrlNoResults&resultNs=Ehost&crlhashurl=login.aspx%3fdirect%3dtrue%26profile%3dehost%26scope%3dsite%26authtype%3dcrawler%26jrnl%3d00941956%26AN%3d102742810>
- Smith, J.A., Flowers, P., & Larkin, M. (2009). *Interpretative phenomenological analysis: Theory, method and research*. London, UK: Sage Publications.
- Stake, R. E. (2000). Case studies. In N. K. Denzin & Y.S. Lincoln (Eds.), *Handbook of qualitative research*, (2nd ed., pp. 435-454). Thousand Oaks, CA: Sage Publications.
- Stark, J. S., Lowther, M. A., Ryan, M. P., & Genthon, M. (1988). Faculty reflect on course planning. *Research in Higher Education*, 29(3), 219-240. doi: 10.1007/BF00992924
- Stevenson, C.B., Duran, R.L., Barrett, K.A., & Colarulli, G.C. (2005). Fostering faculty collaboration in learning communities: A developmental approach. *Innovative Higher Education*, 30(1), 23-36. doi: 10.1007/s10755-005-3293-3
- Stierer, B., & Antoniou, M. (2004). Are there distinctive methodologies for pedagogic research in higher education? *Teaching in Higher Education*, 9(3), 275-285. doi: 10.1080/1356251042000216606
- Stivers, J. (2008). Strengthen your coteaching relationship. *Intervention in School and Clinic*, 44(2), 121-125. doi: 10.1177/1053451208314736
- Taylor, P. C., & Medina, M. (2011). Educational research paradigms: From positivism to pluralism. *College Research Journal*, 1(1), 1-16. doi: 10.13140/2.1.3542.0805
- Taylor, P. C., Taylor, E. L., & Luitel, B. C. (2012). Multi-paradigmatic transformative research as/for teacher education: An integral perspective. In B.J. Fraser, K. Tobin, C.J. McRobbie (Eds.), *Second international handbook of science education* (pp. 373-387). Dordrecht, The Netherlands: Springer.

- Thousand, J. S. (2005). Co-teaching: The scientific evidence. *Stimulating the 'Action' as Participants in Participatory Research, 1*, 1-14. Retrieved from <https://search.informit.com.au/documentSummary;dn=254190401117530;res=IELHSS;type=pdf>
- Tobin, K. (2006). Learning to teach through coteaching and cogenerative dialogue. *Teaching Education, 17*(2), 133-142. doi: 10.1080/10476210600680358
- Tobin, K. (2014). Twenty questions about co-teaching. In K. Tobin & A. Shady (Eds.), *Transforming urban education: Urban teachers and students working collaboratively* (pp. 190-204). doi: 10.1007/978-94-6209-563-2
- Tobin, K., Briscoe, C., & Holman, J. R. (1990). Overcoming constraints to effective elementary science teaching. *Science Education, 74*(4), 409-420. Retrieved from <https://onlinelibrary-wiley-com.dbgw.lis.curtin.edu.au/doi/epdf/10.1002/sc.3730740402>
- Tobin, K., & Roth, W. M. (2005). Implementing coteaching and cogenerative dialoguing in urban science education. *School Science and Mathematics, 105*(6), 313-322. doi: 10.1111/j.1949-8594.2005.tb18132.x
- Hartley, M. S., Treagust, D. F., & Ogunniyi, M. B. (2008). The application of a CAL strategy in science and mathematics for disadvantaged Grade 12 learners in South Africa. *International Journal of Educational Development, 28*(5), 596-611.
- Treagust, D. F., & Fraser, B. J. (1986, April 16-20). *Validation and application of the college and university classroom environment inventory (CUCEI)*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, USA. Retrieved from <https://files.eric.ed.gov/fulltext/ED274692.pdf>
- Treagust, D. F., Won, M., & Duit, R. (2014). Paradigms in science education research. In N.G Lederman & S.K. Abell (Eds.), *Handbook of research on science education* (2nd ed., pp. 3-17). Retrieved from <https://ebookcentral.proquest.com/lib/curtin/detail.action?docID=1734217>
- Trickett, E. J., & Moos, R. H. (1974). *Classroom environment scale (CES): Instruction Manual*. Palo Alto, CA: Consulting Psychologists Press.
- Tuckman, B. W., & Harper, B. (Ed.). (2012). *Conducting educational research* (6th ed.). Lanham, MD: Rowman & Littlefield Publishers.
- Turkich, K., Greive, S., & Cozens, P. (2014). Riders on the storm: A co-teaching mentor model to increase student satisfaction and retention. A practice report. *The International Journal of the First Year in Higher Education Research 5*(1), 135-141. Retrieved from https://espace.curtin.edu.au/bitstream/handle/20.500.11937/42502/226698_157303_88537_184-1400-1-PB.pdf;jsessionid=AD1A6ABE91286EE772E6A080BB8D1B64?sequence=2
- Van den Akker, J. (2003). Curriculum perspectives: An introduction. In J. van den Akker, W. Kuiper, & U. Hameyer (Eds.), *Curriculum landscapes and trends* (pp. 1-10). Dordrecht, The Netherlands: Kluwer Academic Publishers.

- Van der Wende, M. C. (2003). Globalisation and access to higher education. *Journal of Studies in International Education*, 7(2), 193-206.
- Van Luijk, S.J., Smeets, J.G., Smits, J., Wolfhagen, I., & Perquin, M.L. (2000). Assessing professional behaviour and the role of academic advice at the Maastricht Medical School. *Medical Teacher*, 22(2), 168-172. doi: 10.1080/01421590078607
- Vance, L. A. (2001). Teachers' beliefs about co-teaching. *Remedial and Special Education*, 22(4), 245-255. doi: 10.1177/074193250102200408
- Villa, R. A., Thousand, J. S., & Nevin, A. I. (Eds.). (2004). *A guide to co-teaching: Practical tips for facilitating student learning*. Thousand Oaks, CA: Corwin Press.
- Villa, R. A., Thousand, J. S., & Nevin, A. I. (Eds.). (2008). *A guide to co-teaching: Practical tips for facilitating student learning* (2nd ed.). Thousand Oaks, CA: Corwin Press.
- Villa, R. A., Thousand, J. S. & Nevin, A. I. (Eds.). (2013). *A guide to co-teaching: New lessons and strategies to facilitate student learning* (3rd ed.). Thousand Oaks, CA: Corwin Press.
- Walker, S. L., & Fraser, B. J. (2005). Development and validation of an instrument for assessing distance education learning environments in higher education: The Distance Education Learning Environments Survey (DELES). *Learning Environments Research*, 8(3), 289-308. doi: 10.1007/s10984-005-1568-3
- Walkington, J. (2005). Becoming a teacher: encouraging development of teacher identity through reflective practice. *Asia-Pacific Journal of Teacher Education*, 33(1), 53-64. doi: 10.1080/1359866052000341124
- Wallen, N. E., & Fraenkel, J. R. (2001). *Educational research: A guide to the process* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Walther-Thomas, C. S. (1997). Co-teaching experiences: The benefits and problems that teachers and principals report over time. *Journal of Learning Disabilities*, 30(4), 395-407. doi: 10.1177/002221949703000406
- Weinstein, E., & Miller, K. M. (1998). *Mentoring for success*. Des Moines, IA: American Media Pub.
- Weiss, M.P., & Brigham, F.J. (2000). Co-teaching and the model of shared responsibility: What does the research support? In T.E. Scruggs & M.A. Mastropieri (Eds.), *Educational interventions: Advances in learning and behavioral disabilities* (14th ed., pp. 217-245). Bingley, UK: Emerald Group Publishing Limited.
- Wenger, E. (1998). Communities of practice: learning as a social system. *Systems Thinker*, 9(5), 2-3. Retrieved from <https://wenger-trayner.com/wp-content/uploads/2012/01/09-10-27-CoPs-and-systems-v2.01.pdf>
- Wenzlaff, T., Berak, L., Wieseman, K., Monroe-Baillargeon, B. N., & Bradfield-Kreider, P. (2002). Walking our talk as educators: Teaming as a best practice. In E.M. Guyton & J.D. Rainer (Eds.), *Research on meeting and using standards in the preparation of teachers* (pp. 11-24).

- Wilhelm, J. D. (2011). Next Steps in the Journey: Learning to Listen to Student Voices: Teaching with Our Mouths Shut. *Voices from the Middle, 18*(3), 49-52. Retrieved from https://scholar.google.com.au/scholar?hl=en&as_sdt=0%2C5&q=wilhelm%2C+J.+%282011%29%2C+learning+to+listen+to+student+voices&btnG=
- Willis, J. W. (2007). *Foundation of qualitative research: interpretive and critical approaches*. Thousand Oaks, CA: Sage Publications.
- Wilson, G., & Blednick, J. (2011). *Teaching in tandem: Effective co-teaching in the inclusive classroom*. Alexandria, VA: ASCD.
- Worthington, A. C., & Higgs, H. (2010). Economies of scale and scope in Australian higher education. *The International Journal of Higher Education Research, 61*(4), 387- 414. doi: 10.1007/s10734-010-9337-3
- Yalon-Chamovitz, S., Kraiem, Y., & Gutman, C. (2017). Deconstructing hierarchies: Service users asco-teachers in occupational therapy education. *Work, 56*(3), 381-386. doi: 10.3233/WOR-172502
- Yanamandram, V. K., & Noble, G. I. (2005). Team teaching: student reflections of its strengths and weaknesses. In R. Atkinson & J. Hobson (Eds.), *Teaching and learning forum: The reflective practitioner* (pp. 1-10). Australia: Murdoch University. Retrieved from <https://ro.uow.edu.au/cgi/viewcontent.cgi?referer=http://scholar.google.com.au/&httpsredir=1&article=2439&context=commpapers>
- Yin, R. K. (Ed.). (2009). *Case study research: design and methods (applied social research methods)* (4th ed.). Thousand Oaks, CA: Sage Publications.
- York-Barr, J., Bacharach, N., Salk, J., Frank, J., & Beniek, B. (2004). Team teaching in teacher education: general and special education faculty experiences and perspectives. *Issues in Teacher Education, 13*, 73-94. Retrieved from <https://www.itejournal.org/back-issues/spring-2004/yorkbarr.pdf>

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Appendices

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Appendix A Unit Coordinator Information Form

Co-Teaching in Health Sciences in Higher Education

Informed consent for Unit Coordinator

Dear Hannah,

My name is Arpana Dhar and I am a Doctoral student at Curtin University. I am interested in observing co-teaching practices currently implemented in 'Human Structure and Function100' unit that you coordinate.

This letter is written to request your permission to gather data to analyse co-teaching practices at undergraduate level in a tertiary institute. I intend to administer survey to both co- teachers and students to gather their perceptions and experiences of co-teaching practices. I request your permission, as a researcher, to conduct interviews with some students and co- teachers who voluntarily agree to it to get a deeper understanding of co-teachers' interactions as part of my data collection.

If you agree to participate, you will be agreeing to allow me to collect data from students and co-teachers. Individual consent forms will be given to co-teachers and students and if they do not want to be a part of this study they can withdraw at any time without any consequence. I ensure you that there will be no risks in participating in this research beyond those that are ordinary in day to day life. Questions in the survey and interview should not cause any discomfort; however, if this occurs they may choose not to answer without penalty or withdraw their participation. I would take utmost care not to cause any disruption to normal running of classes.

This research proposal has received ethics approval from Curtin University Human Research Ethics Committee (SMEC-13-14). If you would like further information about the study, please feel free to contact me on 9266 3211 or by email Arpana.Dhar@curtin.edu.au. Alternatively, you can contact my supervisor Prof. David Treagust on 9266 7924 or D.F.Treagust@curtin.edu.au or co-supervisor Assoc. Prof. Georgina Fyfe on 9266 7364 or G.M.Fyfe@Curtin.edu.au.

Please accept my thanks in advance for your assistance in this research study.

Regards,

Arpana Dhar

I permit Arpana Dhar to administer the survey questionnaire in HSF100 tutorial sessions.

Hannah Crabb

Unit Coordinator HSF100 (HUMB1000)

Appendix B Co-Teacher Information Form

Co-Teaching in Health Sciences in Higher Education

Co-Teacher Information Sheet

I, Arpana Dhar, am a doctoral student currently working on collecting research data for my Ph.D. at Curtin University. I invite you to consider taking part in this research.

Title of project:

Co-Teaching in Higher Education – An Australian Study

Background:

“Co-teaching occurs when two or more educators share instructional responsibility for same group of students in a single workspace sharing ownership, accountability and responsibility though their participation might vary in different sessions” (Friend & Cook, 2010). The overarching aim of the proposed research is to provide an evidence-based evaluation of co-teaching strategies in a common interprofessional first year Health sciences unit, Human structure and Function 100 (HSF100), at Curtin University.

Purpose of Research

We are investigating the teachers’ perceptions and experiences of co-teaching in HSF 100 unit.

Your Role

We are interested in working together with you in HSF100. As an HSF100 tutor you are under no obligation to participate, but we hope to get your valuable input. If you choose to participate in this study, you will complete a paper based survey asking few demographic questions, some feedback about your experiences during co-teaching and your interaction with your co-tutor/s. The survey is completely anonymous and no record of the names of participants will be kept with the survey data. An individual interview is intended later on. Your much appreciated comments will help to modify co-teaching practice to improve teaching and learning experiences for all.

Consent to Participate

Your involvement in the research is entirely voluntary. You have the right to withdraw at any stage without it affecting your rights or my responsibilities.

Confidentiality

The information you provide will be kept separate from your personal details, and only me and my supervisors will have access to the data. The interview transcript will not have your name or any other identifying information on it and in adherence to university policy, the interview recordings and transcribed information will be kept in a locked cabinet for at least seven years, before a decision is made as to whether it should be destroyed.

Further Information

This study has been approved under Curtin University's process for lower-risk Studies (Approval Number SMEC-13-14). This process complies with the National Statement on Ethical Conduct in Human Research (Chapter 5.1.7 and Chapters 5.1.18-5.1.21).

For further information on this study contact the researcher, Arpana Dhar, on 9266 3211 or by email Arpana.Dhar@curtin.edu.au. Alternatively, you can contact my supervisor Prof. David Treagust on 92667924 or D.F.Treagust@curtin.edu.au or co-supervisor Dr. Georgina Fyfe on 92667364 or G.M.Fyfe@Curtin.edu.au or the Curtin University Human Research Ethics Committee. c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth 6845 or by telephoning 9266 9223 or by emailing hrec@curtin.edu.au.

Thank you very much for your consideration on taking part in this research. Your participation is greatly appreciated

Yours sincerely,

Arpana Dhar

Appendix C Student Information Form

Co-Teaching in Health Sciences in Higher Education

Student Information Sheet

Dear Students,

We invite you to consider taking part in the research study ‘Co-teaching: A case study of co- teaching practices in tertiary education’.

Purpose of Research

“Co-teaching occurs when two or more educators share instructional responsibility for same group of students in a single workspace sharing ownership, accountability and responsibility though their participation might vary in different sessions” (Friend & Cook, 2010). We are investigating your perceptions and experiences of co-teaching currently practiced in this unit.

Your Role

We are interested in finding out your opinions regarding co-teaching experiences. We are providing you with a paper based survey questionnaire that will take 15-20 minutes to complete. You will not only get an opportunity to share your experiences but it will also enable you to influence teaching practice for better learning experiences of future students. Voluntary recruitment of students for an interview is also intended.

Consent to Participate

Your involvement in the research is entirely voluntary. You have the right to withdraw at any stage of the research without any consequences.

Confidentiality

The information you provide will be anonymous and only me & my supervisors will have access to this.

Further Information

This study has been approved under Curtin University's process for lower-risk Studies (Approval Number SMEC-13-14). This process complies with the National Statement on Ethical Conduct in Human Research (Chapter 5.1.7 and Chapters 5.1.18-5.1.21).

For further information on this study contact the researcher, Arpana Dhar, on 9266 3211 or by email Arpana.Dhar@curtin.edu.au. Alternatively, you can contact my supervisor Prof. David Treagust on 92667924 or D.F.Treagust@curtin.edu.au or co-supervisor Dr. Georgina Fyfe on 92667364 or G.M.Fyfe@Curtin.edu.au or the Curtin University Human Research Ethics Committee. c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth 6845 or by telephoning 9266 9223 or by emailing hrec@curtin.edu.au

Thank you very much for your consideration on taking part in this research. Your participation is greatly appreciated.

Yours sincerely,

Arpana Dhar

Appendix D Co-Teacher Consent Form

Co-Teaching in Health Sciences in Higher Education

Co-Teacher Consent Form

- I understand the purpose and procedures of the study.
- I have been provided with the participation information sheet.
- I understand that the procedure itself may not benefit me.
- I understand that my involvement is voluntary and I can withdraw at any time without problem.
- I understand that no personal identifying information like my name or address will be used in any published materials.
- I understand that all information will be securely stored for at least 7 years before a decision is made as to whether it should be destroyed.
- I understand that updates of the progress of the research will be provided to me.
- I have been given the opportunity to ask questions about this research.
- I agree to participate in the study outlined to me.

Name: _____

Signature: _____

Date: _____

Appendix E Student Consent Form

Co-Teaching in Health Sciences in Higher Education

Student Consent Form

- I understand the purpose and procedures of the study.
- I have been provided with the participation information sheet.
- I understand that the procedure itself may not benefit me.
- I understand that my involvement is voluntary and I can withdraw at any time without problem.
- I understand that no personal identifying information like my name or address will be used in any published materials.
- I understand that all information will be securely stored for at least 7 years before a decision is made as to whether it should be destroyed.
- I understand that updates of the progress of the research will be provided to me.
- I have been given the opportunity to ask questions about this research.
- I agree to participate in the study outlined to me.

Name: _____

Signature: _____

Date: _____

11. What do you expect to learn in a co-teaching workshop?

Section 2. About co-teaching

Please indicate your level of agreement with the following statements about your co-teaching experience and expectation in HSF100 classes, by selecting “strongly agree” (SA), “agree” (A), “not sure” (N), “disagree” (D), or “strongly disagree” (SD). You can add further comments in the textbox following some questions. The information you provide will not be linked with your identity as the survey is totally anonymous.

1. I was informed that co-teaching would be the teaching method before starting to teach this unit.

Yes No

2. I have co-taught during my previous years of teaching experience.

Yes No

3. I experience co-teaching as a teaching strategy in other units that I currently teach at Curtin University. If ‘Yes’ please name the unit.

Yes No Unit name _____

4. Both of us go out of the way to explain concepts to students.

SD D N A SA

5. Both of us show interest in providing to student’s learning difficulties.

SD D N A SA

6. Both of us talk individually with students if they have any problem.

SD D N A SA

7. Both of us move about in the class to interact with students.

SD D N A SA

8. Both of us respect students' opinions.
SD D N A SA
9. Both of us are friendly and considerate towards students.
SD D N A SA
10. Both of us provide useful feedback to support student learning.
SD D N A SA
11. My teaching is better in co-taught classes.
SD D N A SA
12. I like the concept of having two tutors in the class.
SD D N A SA
13. I feel comfortable teaching with another tutor in the class.
SD D N A SA
14. I would welcome additional units adopting a co-teaching model.
SD D N A SA
15. I would prefer to work as a single teacher in the class.
SD D N A SA
16. Both of us work in the class as a team.
SD D N A SA
17. Both of us share the teaching responsibility in the class equally
SD D N A SA
18. Both of us co-operate with each other on class activities.
SD D N A SA
19. Both of us share ideas and suggestions while doing class-activities.
SD D N A SA
20. Both of us have similar roles in the classroom.
SD D N A SA

21. Both of us give same opportunities to all students to answer questions.
SD D N A SA
22. Both of us give equal encouragement to all the students.
SD D N A SA
23. Both of us treat all the students same in this class.
SD D N A SA
24. Both of us support every students work equally in this class.
SD D N A SA
25. All students have same amount of say in this class.
SD D N A SA
26. All the students have equal opportunity to explain solutions in this class.
SD D N A SA
27. Both of us often think of different ways to demonstrate class activities.
SD D N A SA
28. Teaching approaches in this class are characterised by innovation and variety.
SD D N A SA
29. Activities done by both of us in class seem to be relevant to the content.
SD D N A SA
30. New ideas are tried out in this class.
SD D N A SA
31. Both of us think of innovative ways of teaching the content.
SD D N A SA
32. Both of us present different views of the subject matter.
SD D N A SA

33. What do you like about co-teaching?

34. What don't you like about co-teaching?

35. What are your suggestions to improve co-teaching in coming years?

Thanks for completing this survey.

Section 2. About co-teaching

Please indicate your level of agreement with the following statements about your co-teaching experience and expectation in HUMB1000 (HSF100) classes, by clicking on “strongly agree” (SA), “agree” (A), “not sure” (N), “disagree” (D), or “strongly disagree” (SD). You can add further comments in the textbox following each question. The information you provide will not be linked with your identity as the survey is totally anonymous.

1. I was informed that co-teaching would be the teaching method in this unit before starting HSF100 unit.

Yes No

2. I have experienced co-teaching as a teaching strategy during my previous years of education

Yes No

3. I experience co-teaching as a teaching strategy in other units that I am currently enrolled in. If ‘Yes’ name the unit.

Yes No Unit name _____

4. Both tutors go out of the way to explain concepts to students.

SD D N A SA

5. Both tutors show interest in providing to student’s learning difficulties.

SD D N A SA

6. Both tutors talk individually with students if they have any problem.

SD D N A SA

7. Both tutors move about in the class to interact with students.

SD D N A SA

8. Both tutors respect students’ opinions.

SD D N A SA

9. Both tutors are friendly and considerate towards students.

SD D N A SA

10. Both tutors provide useful feedback to support my learning.
SD D N A SA
11. My learning is better in this class where two tutors teach together.
SD D N A SA
12. I like the concept of having two tutors in the class.
SD D N A SA
13. I feel confused by two tutors in the class.
SD D N A SA
14. I would welcome additional units adopting a co-teaching model.
SD D N A SA
15. I would prefer to work with only one teacher in the class.
SD D N A SA
16. Both tutors work in the class as a team.
SD D N A SA
17. Both tutors share the teaching responsibility in the class equally
SD D N A SA
18. Both tutors co-operate with each other on class activities.
SD D N A SA
19. Both tutors share ideas and suggestions while doing class-activities.
SD D N A SA
20. Both tutors have similar roles in the classroom.
SD D N A SA
21. I get the same opportunities to answer questions as other students.
SD D N A SA
22. I receive same encouragement from the tutors as other students do.
SD D N A SA

23. I am treated the same as all other students in this class.
SD D N A SA
24. My work receives as much support as other students' work in this class.
SD D N A SA
25. All students have same amount of say in this class.
SD D N A SA
26. I am given equal opportunity to explain my solutions to problems.
SD D N A SA
27. Both tutors often think of different class activities every week.
SD D N A SA
28. Teaching approaches in this class are characterised by innovation and variety.
SD D N A SA
29. Activities done by both tutors in class seem to be relevant to the content.
SD D N A SA
30. New ideas are seldom tried out in this class.
SD D N A SA
31. Both tutors think of innovative ways of teaching the content.
SD D N A SA
32. Both tutors present different views of the subject matter.
SD D N A SA
33. What do you like about co-teaching?

--

34. What don't you like about co-teaching?

35. What are your suggestions to improve co-teaching in coming years?

Thanks for completing this survey.

Appendix H Co-Teacher Interview Questionnaire

Co-Teacher Interview Questionnaire

Thank you for agreeing to participate in this interview which will take about an hour. Just to confirm that you have given consent for this interview. There are no right or wrong answers, but only your expectations and experiences with co-teaching and co-tutor/s. The aim is to collect qualitative data to help understand how co-teaching works so that the policy makers will be better able to understand its complexities. All responses will be anonymous and the data de-identified. The actual data will only be accessible to me & my supervisors.

1. How many semesters have you been teaching HSF100? Were you involved in the previous courses Bio 133 and 134?
2. What is your understanding of co-teaching as a teaching method?
3. Does it happen that way in your classes?
4. What was your reaction when you were informed that you have to co-teach in this unit?
5. What do you think is your role as a co-teacher?
6. What are your expectations from your co-teacher?
7. How would you describe the division of responsibility for teaching between the two of you?
8. Have you ever had a difference of opinion with regard to teaching belief, pedagogy, student interaction or content with your co-teacher? Have any other areas of difference arisen? Please identify these.
9. Were you able to resolve any of these issues? Can you describe how you resolved any issues?
10. Did this result in positive changes to the co-teaching?
11. How do you think that different co-teachers influence your practice/ideas about teaching? Please explain?
12. How do you think your teaching style has been influenced in any way by co-teaching?

13. What is your view about the curriculum designed for this unit? Do you have a say in designing activities and materials presented each week?
14. Do the assessments match the stated outcomes for this unit?
15. Referring to the table, which model/s of co-teaching do you usually employ while teaching?

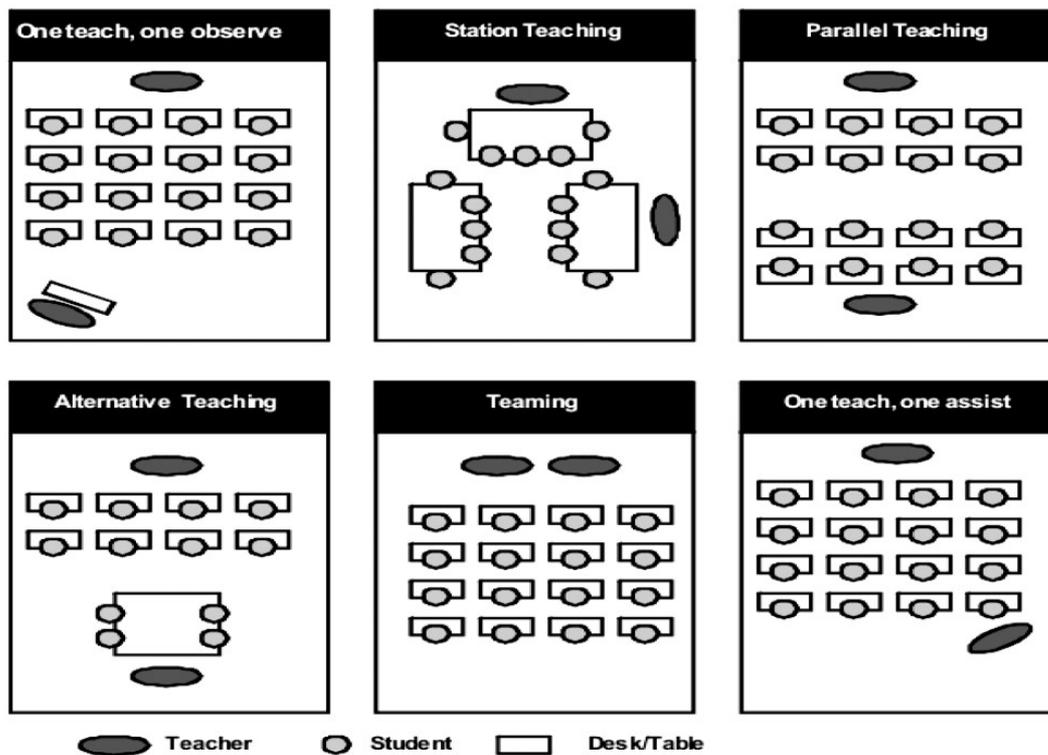


Figure 1. Co-Teaching Approaches. From Friend & Bursuck (2009). *Including Students With Special Needs: A Practical Guide for Classroom Teachers* (5th ed., p. 92). Columbus, OH: Merrill.

- a. One teach, one observe, in which one teacher leads large-group instruction while the other gathers academic, behavioural, or social data on specific students or the class group;
- b. Station teaching, in which instruction is divided into three non-sequential parts and students, likewise divided into three groups, rotate from station to station, being taught by the teachers at two stations and working independently at the third;
- c. Parallel teaching, in which the two teachers, each with half the class group, present the same material for the primary purpose of fostering instructional differentiation and increasing student participation;

- d. Alternative teaching, in which one teacher works with most students while the other works with a small group for remediation, enrichment, assessment, pre-teaching, or another purpose;
 - e. Teaming, in which both teachers lead large-group instruction by both lecturing, representing opposing views in a debate, illustrating two ways to solve a problem, and so on; and
 - f. One teach, one assist, in which one teacher leads instruction while the other circulates among the students offering individual assistance.
16. What other information regarding co-teaching and co-tutors would you like to add that was not addressed in the interview?
17. Describe what you like about co-teaching?
18. Do you think this strategy is an effective pedagogical practice? Why?
19. Describe any perceived drawbacks in this teaching strategy?
20. Have you received any professional development support for co-teaching from Curtin University and how frequent? Was that of any help or not?
21. What suggestions do you have that would increase effectiveness of this service delivery method for you?
22. How is co-teaching different from single teacher teaching? Which one would you prefer?
23. Why do you think co-teaching was chosen as content delivery pedagogy?
24. Do you think it achieves that outcome?
25. Any other suggestions/information that you would like to add to improve co-teaching and co-teachers' interactions and experiences?

Appendix I Coding Scheme (CPES Teachers' Survey)

	What are your suggestions to improve CT in coming years	Coding	Themes
1	compulsory co-teaching workshop with another as follow up, mixed gender pairs,	Training purposeful pairing (PP)	Professional development/ Training
2	some tutors do not understand concept of co-teaching/facilitating , it is not about delivering slide content	ignorance of CT/training	
3	regular discussion between tutors about how to improve their teaching, both have to adjust their teaching tone	Collaboration & communication	Ignorance of CT
4	more PD sessions for co-teaching	training	
5			Purposeful pairing
6	workshops to learn strategies, techniques; demo of model of great co-teaching styles, identify & continue with compatible CT pairs	training PP	
7	time to plan an approach, work with like-minded people, a set of agreed principles of student behaviours, teaching, discipline, role marking	CC PP	Communication & Collaboration
8	automated process to match tutor profiles that can reduce inappropriate matching, gauge personal progress	PP	
9	more PD for tutors on how to work together, negotiate & benefits of collegial co-teaching	self-reflection Training	Self-reflection
10	more PD on how to work with a co-tutor, ideas, tools on how to run activities with 2 tutors, most of times teach half session not together	ignorance/training training Ignorance/training	
11	more communication between co-tutors on sharing activities, strategies for classroom behaviour management	CC	
12	unsure, would need to consider specific units/cohorts		
13	pay co-tutors for preparation, evaluation & attending co-teaching PD sessions, flexibility to choose co-tutor for better combinations, pair inexperienced with UC as exemplars	training PP	
14	-		
15	regular debriefing about methods & activities, more paid time for reflection & preparation,	training Self Reflection	

16	experience with a few to find best compatibility, getting to know your co-tutor & develop respectful & professional relationship	PP CC
17	be open to new teaching styles, build relationship in staff meetings, support with paid PD training	CC training
18	not sure??	
19	more PD	training
20	-	
21	meeting at the start of year to revise team teaching strategies with all, remind them of role & responsibilities	training/CC
22		
23	workshop training and pre-class agreement about how to run session	training CC
24	sessions to facilitate open communication	CC/training
25	making tutors aware that pairing is purposeful - more experienced paired with less experienced increasing confidence of less experienced	PP
26	each class is varied, no 2 co-tutors are same	

What are your expectations from a CT workshop	Codes	Themes
concept of co-teaching, benefits & strategies of CT, problem solving if any issue, how to make most of CT	Philosophy of CT, conflict res.	① Philosophy of CT
co-teaching skills - not teaching slide by slide but interacting & engaging together to best facilitate	CT strategies	• concept • benefits/adv. • disadvantages • what to do??
tutors to be put in scenarios for practicing delivered techniques	real life experience	② CT strategies
different teaching strategies & new ways to engage students	CT strategies, student engagement	• styles • techniques • way to CT • team teach • approaches
expand my knowledge from listening to co-teachers, observe different ways of presentation	real life experience	③ Real life experience
techniques, strategies, examples of how to present/teach a topic with a co-tutor, support network & resources	CT strategies, real life exp, support	• practice tech • observe diff. CT • examples of CT • hear experience • discuss CT
how to negotiate role & work effectively	collaboration	④ Collaboration
ways to co-teach well, willingness to learn from co-tutors offers the opportunity to transiently develop the entire teaching cohort's skills.	CT strategies,	• role negotiation • work tog. as a team • comm. strategies • share work/idea • expectations
how to work together as a team to teach effectively and assist students achieve learning outcomes	collaboration	⑤ Conflict resolution
different teaching techniques, alternative ways to engage students & explain difficult concepts	CT strategies, student eng.	6. Learning Env.
experience diff teaching styles, hear their experiences from their field, further development of capacity to work collaboratively & effectively	CT strategies, real life exp, collaboration	• student interac • s. engagement
advantages/disadvantages of CT, strategies to maximise & minimise these respectively	Philo of CT, CT strategies	
team teaching & classroom management strategies, conflict resolution	CT strategies, management, conflict resolution	
the one we had was great, covered the right material		
strategies for communication, work load sharing, use of teaching equipment, student interaction.	communication strat, collab, student interaction	
expectations of each tutor, methods of sharing teaching	collaboration	
demonstration of co-teaching model (done in workshop)	real life experience	
benefits to students, strategies to cope with situations arising out of differences of opinions, teaching styles	concept of CT, conflict res., CT styles	

Appendix J Text Search Query (Different)

