



MONASH University

Peer Assisted Learning in Allied Health Professional Clinical Education

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A thesis submitted for the degree of Doctor of Philosophy at

Monash University in 2016

Faculty of Medicine, Nursing and Health Sciences

Departments of Physiotherapy and HealthPEER

(Health Professions Education and Educational Research)

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Table of Contents

Abstract.....	8
General Declaration	11
Thesis including published works declaration	12
Acknowledgements.....	18
Oral presentations by candidate.....	19
List of publications	20
List of tables	21
List of figures.....	23
List of appendices	25
Chapter 1: Introduction	26
1.1 Background	26
1.1.1 Theory informing PAL.....	26
1.1.2 From the Theoretical to the Practical	30
1.1.3 PAL in Allied Health Professional Clinical Education.....	30
1.1.4 Implementation of PAL within the 2:1 model in the clinical setting	32
1.2 Systematic literature review	33
1.2.1 Research Questions.....	33
1.2.2 Method	34
1.2.3 Results.....	37
1.2.4 Discussion.....	45
1.2.5 Conclusion.....	47
1.3 Thesis proposal	48
1.3.1 Research questions	48
1.3.2 Research aims & approach	48
1.4 An overview of following chapters	49
Chapter 2: Methods	51
2.1 An overview of research studies.....	51
2.2 Rationale for research design	51
2.2.1 Researcher reflexivity	53
2.3 Research timeline	55
2.4 Ethics	56

2.5 Setting	56
2.6 Participants	57
2.6.1 Recruitment and participant flow through studies	57
2.6.2 Inclusion and exclusion criteria.....	58
2.7 Outcome measures	58
2.7.1 Student activity record.....	58
2.7.2 Clinical educator workload statistics	59
2.7.3 Surveys and focus groups	59
2.8 Reliability and validity of measurement tools used in the research program.....	60
2.8.1 Reliability and validity of the primary outcome measure.....	60
2.8.2 Qualitative data credibility and trustworthiness	60
2.9 Data collection and management.....	61
2.10 Data Analyses	61
2.10.1 Quantitative data analyses	61
2.10.2 Qualitative data analyses	61
2.11 Summary of research methods.....	62
Chapter 3: The development of a peer assisted learning model of clinical education for entry-level physiotherapy students	63
Preface	63
3.1 Introduction	63
3.2 Method.....	65
3.3 Results	68
3.4 Discussion.....	75
3.5 Conclusion	78
Chapter 4: Traditional versus peer-assisted models of clinical education for paired physiotherapy students: a randomised trial	79
Preface	79
4.1 Introduction	79
4.2 Method.....	81
4.3 Results	85
4.4 Discussion and Limitations.....	93
4.5 Conclusion	97
Chapter 5: Physiotherapy students and clinical educators perceive several ways that incorporating peer-assisted learning could improve clinical placements: a qualitative study.	98
Preface	98

5.1 Introduction	98
5.2 Method.....	99
5.3 Results	100
5.4 Discussion and Limitations.....	108
5.5 Conclusion	111
Chapter 6: Education in peer learning for allied health clinical educators: a mixed methods study.	112
Preface	112
6.1 Introduction	112
6.2 Method.....	114
6.3 Results	117
6.4 Discussion and Limitations.....	124
6.5 Conclusion	127
Chapter 7: Implementing peer-assisted learning in clinical education.	128
Preface	128
7.1 Introduction	128
7.2 Method.....	129
7.3 Results: The COM-B Model for implementing PAL in clinical education	129
7.4 Summary	138
Chapter 8: Challenging assumptions on peer assisted learning in clinical education.	139
Preface	139
8.1 Introduction	139
8.2 Methods (stage 1)	140
8.3 Results (stage 1)	141
8.4 Methods (stage 2)	146
8.5 Results (stage 2)	149
8.6 Discussion.....	158
8.7 Conclusion	161
Chapter 9: Discussion.....	163
9.1 Key findings	163
9.2 Strengths and limitations of the research program.....	165
9.3 Implications for practice	166
9.3.1 Implications for clinical education researchers	166
9.3.2 Implications for clinical education co-ordinators implementing placement models	166
9.3.3 Implications for clinical educators utilising PAL.....	167

9.4 Future research directions	167
9.4 Conclusion	169
References	170
Appendices	188
Appendix A Ethics approvals	189
PAL RCT health service ethics approval	189
PAL RCT University ethics approval	190
Multidisciplinary trial ethics approval.....	191
Appendix B Tools used in the Peer Assisted Learning Model	192
SNAPPS tool	192
Peer Observation Record	193
Complexity-Risk Matrix	194
Appendix C Data collection templates	195
Clinical Educator Statistics	195
Student Activity Record	196
Appendix D Surveys	197
PAL RCT student survey 1 – end of each rotation.....	197
PAL RCT student survey 2 – end of intervention	198
PAL RCT clinical educator survey 1 – end of each rotation.....	199
PAL RCT clinical educator survey 2 – end of intervention	200
Multidisciplinary trial clinical educator survey 1 – prior to education	201
Multidisciplinary trial clinical educator survey 2 – on completion of education.....	202
Multidisciplinary trial clinical educator survey 3 – completed at each step.....	203
Appendix E Focus Groups.....	204
PAL RCT student flyer.....	204
PAL RCT student focus group prompts	205
PAL RCT clinical educator flyer.....	206
PAL RCT educator focus group prompts	207
Multidisciplinary trial student focus group prompts	208
Multidisciplinary trial student clinical educator group prompts	209
Appendix F Resources developed	210
PAL workshop slides.....	210
PAL workshop session plan	211
PAL “train the trainer” workshop session plan.....	212

PAL online clinical supervision training modules.....	213
Appendix G Study conducted prior to enrolment	214

Abstract

Peer assisted learning (PAL) is an educational approach supported by social learning theory and involves students learning with and from each other. Peer assisted learning has been utilised and researched extensively within the classroom setting and the basis of its success lies in its capacity to empower active involvement from students in their own learning. Reports on PAL in health professional education suggest that not only is PAL an effective strategy for developing students' knowledge and clinical skills, but importantly the process of PAL can also assist in the development of productive learner behaviours and professional skills such as communication and collaboration. There are many different types of PAL: it can be formal or informal, structured or unstructured, intentional or unintentional and with or without facilitation.

Despite promising results in classroom-based health education, the uptake of PAL in the clinical education setting has been less common. Peer assisted learning can be utilised when clinical educators supervise more than one student concurrently, however traditionally allied health clinical education has been undertaken in a 1:1 student : clinical educator model. The benefits of implementing PAL in the clinical education setting may be twofold: it may be an effective learning strategy for students and may also form a framework by which clinical educators could supervise multiple students concurrently, potentially assisting in addressing the shortfall in clinical placement availability.

Literature pertaining to alternative 'multiple student to clinical educator' placement models is emerging in allied health professional education, predominantly examining the effects of the 2:1 or 'paired' model, where two students are supervised by one clinical educator. Peer assisted learning is often cited as one of the factors contributing to the success of the paired student clinical education model, however PAL may or may not occur, depending on various factors within the context of the learning environment. Reports on paired student clinical education models to date have often failed to define PAL or measure and report on the occurrence and effects of PAL within the model. To examine this further, this research aimed to investigate the types of PAL that are acceptable to students and clinical educators within the paired student clinical education model, and the effect on student learning and clinical educator service delivery.

Three studies were conducted within the research program, examining paired allied health professional clinical placement models with same-level peers (as opposed to near peers, or students from different year levels) specifically in the clinical placement setting. The research program utilised a mixed methods approach, incorporating various designs of qualitative and quantitative investigation across different allied health professions and different clinical placement settings.

Study 1 utilised a participatory approach, involving clinical educator stakeholders in the development of a paired placement model which specifically aimed to promote PAL within the model. Study 2 involved a randomised cross-over design to trial the PAL model developed, compared with a 'traditional' approach to paired placement models where PAL was not actively facilitated. Study 3 utilised a stepped wedge design to examine the effects of the clinical educator training module associated with the PAL model. Finally, the results of all three studies were synthesised with the results of the systematic literature review and the relevant educational theory to develop recommendations for PAL implementation.

The findings from this program of research support the use of PAL as an educational strategy for allied health professions in the clinical setting. Benefits reported by clinical educators included reduced educator burden, improved use of student 'downtime' and that PAL helped students to build professional skills such as teamwork, communication and feedback capabilities. Students reported that the psychological safety created by PAL enabled them to raise concerns about their own knowledge and practice, when compared to working with an expert other. Both students and educators gave examples of where PAL helped to position students as active learners through reduced dependence on the clinical educator. Cohesion of the student to student relationship was seen as an enabler of successful PAL, and there was also agreement that collaboration is a professional expectation.

The RCT (study 2) demonstrated that specific PAL activities can be integrated into the clinical education of paired students without sacrificing student performance outcomes. Although the quantitative data supported some positive outcomes under the PAL model, both educators and students were more satisfied with the traditional approach. The rigidity of the prescribed model was cited as the major source of dissatisfaction. This clear finding informed the design of the multidisciplinary trial (study 3) where clinical educators and students were not required to adhere to a prescribed model with mandated frequency of activities, but instead were trained and supported to implement the elements of the PAL model flexibly.

Clinical educators identified that facilitating PAL is a complex skill which takes education, resource and time to develop. When clinical educators were provided with training in PAL (study 3), their perceived confidence to facilitate PAL improved, there was a self-reported change in their education behaviours and some changes in the PAL activities students undertook whilst on placement. Students reported that PAL enhances the clinical learning experience, but it was not a replacement for skilled clinical educator practice modelling, feedback and guidance. The importance of skilled

educators was highlighted to mitigate challenges associated with managing peer relationships and maintaining individualised feedback in the paired model.

This comprehensive research program informs the current discourse on PAL in allied health professional clinical education. It is the first published research program designed to specifically examine the effects of PAL occurring *within* a paired student clinical education model and the first to measure the effect of training clinical educators in facilitating PAL on student reported activity. The program has developed and tested a repeatable, quantifiable PAL model for the clinical education of paired students. The model has been refined based on empirical findings and stakeholder feedback to produce a flexible PAL framework to guide practice. Future work should focus on longitudinal studies investigating how students evolve in their peer learning practices over time, and whether these competencies influence their capacities to operate in the workforce. Longitudinal studies could also examine how clinical educators' facilitatory practices change over time. The experimental designs and participatory approaches utilised in this research program may be applicable to many clinical and education contexts to develop further robust evidence in this area.

General Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Signature: 

Print Name: Samantha Sevenhuysen

Date: 10th October 2016

Thesis including published works declaration

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes five original papers published in peer reviewed journals and two unpublished publications. The core theme of the thesis is peer assisted learning in allied health professional clinical education. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the student, working within the Faculty of Medicine, Nursing and Health Sciences under the supervision of Professor Terry Haines and Associate Professor Elizabeth Molloy.

The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

Thesis chapter	Publication title	Publication status	Nature and % of student contribution	Co-author name(s) Nature and % of Co-author's contribution	Co-author(s), Monash student Y/N
1.2	Peer Assisted Learning in education of Allied Health Professional students in the clinical setting: a systematic review.	In press <i>Journal of Allied Health</i>	Led the conception of the study, undertook data extraction, led data analysis & synthesis, drafted and prepared the manuscript for publication; 70%	Thorpe, J: undertook independent data extraction, contributed to data analysis & synthesis and manuscript preparation: 15%; Molloy, E: Contributed to the conception of the study, undertook data analysis, assisted in the drafting of the manuscript: 5%; Keating, J: Contributed to the conception of the study, undertook data analysis, assisted in the drafting of the manuscript: 5%; Haines, T: Contributed to the conception of the study, undertook data analysis, assisted in the drafting of the manuscript: 5%	N
3	The development of a peer assisted learning model for the clinical education of physiotherapy students.	Published <i>Journal of Peer Learning</i>	Led the conception of the study, undertook data collection, led data analysis & synthesis, drafted and prepared the manuscript for publication; 75%	Nickson, W: Contributed to the conception of the study, undertook data collection & analysis, assisted in the drafting of the manuscript: 5%; Farlie, M: Contributed to the conception of the study, undertook data collection & analysis, assisted in the drafting of the manuscript: 2% Raitman, L: Contributed to the conception of the study, undertook data collection: 2% Keating, J: Contributed to the conception of the study, assisted in the drafting of the manuscript: 2% Molloy, E: Contributed to the conception of the study,	N

				<p>undertook data collection & analysis, assisted in the drafting of the manuscript: 5%</p> <p>Skinner, E: Contributed to the conception of the study, undertook data collection & analysis, assisted in the drafting of the manuscript: 2%</p> <p>Maloney, S: Contributed to the conception of the study, undertook data collection & analysis, assisted in the drafting of the manuscript: 2%</p> <p>Haines, T: Contributed to the conception of the study, undertook data collection & analysis, assisted in the drafting of the manuscript: 5%</p>	
4	Educators and students prefer traditional clinical education to a peer-assisted learning model, despite similar student performance outcomes a randomised trial.	Published <i>Journal of Physiotherapy</i>	Led the conception of the study, undertook data collection, led data analysis & synthesis, drafted and prepared the manuscript for publication; 75%	<p>Nickson, W: Contributed to the conception of the study, undertook data collection, assisted in the drafting of the manuscript: 2%;</p> <p>Farlie, M: Contributed to the conception of the study, undertook data collection & analysis, assisted in the drafting of the manuscript: 2%</p> <p>Raitman, L: Contributed to the conception of the study, undertook data collection: 5%</p> <p>Keating, J: Contributed to the conception of the study, assisted in the drafting of the manuscript: 2%</p> <p>Molloy, E: Contributed to the conception of the study, undertook data collection & analysis, assisted in the drafting of the manuscript: 5%</p> <p>Skinner, E: Contributed to the conception of the study, undertook data collection & analysis, assisted in the drafting of the manuscript: 2%</p> <p>Maloney, S: Contributed to the conception of the study, undertook data collection & analysis, assisted in</p>	N

				the drafting of the manuscript: 2% Haines, T: Contributed to the conception of the study, undertook data collection & analysis, assisted in the drafting of the manuscript: 5%	
5	Physiotherapy students and clinical educators perceive several ways in which peer-assisted learning could improve clinical placements: a qualitative study.	Published <i>Journal of Physiotherapy</i>	Led the conception of the study, undertook data collection, led data analysis & synthesis, drafted and prepared the manuscript for publication; 70%	Farlie, M: Contributed to the conception of the study, undertook data collection, independent coding & analysis, assisted in the drafting of the manuscript: 10% Keating, J: Contributed to the conception of the study, assisted in the drafting of the manuscript: 5% Haines, T: Contributed to the conception of the study, assisted in the drafting of the manuscript: 5% Molloy, E: Contributed to the conception of the study, undertook data collection & analysis, assisted in the drafting of the manuscript: 10%	N
6	Education in peer learning for allied health clinical educators: a mixed methods study.	Accepted pending revisions <i>Focus on Health Professional Education</i>	Led the conception of the study, undertook data collection, led data analysis & synthesis, drafted and prepared the manuscript for publication; 65%	Thorpe, J: undertook data collection, independent coding, contributed to data analysis & synthesis and manuscript preparation: 15%; Barker, L: undertook data collection, contributed to manuscript preparation: 5%; Keating, J: Contributed to the conception of the study, undertook data analysis, assisted in the drafting of the manuscript: 5%; Haines, T: Contributed to the conception of the study, undertook data analysis, assisted in the drafting of the manuscript: 5% Molloy, E: Contributed to the conception of the study, undertook data analysis, assisted in the drafting of the manuscript: 5%;	N


7	Implementing collaborative and peer-assisted learning in clinical education.	Published <i>The Clinical Teacher</i>	Led the conception of the paper, led data synthesis, drafted and prepared the manuscript for publication; 80%	Keigaldie, D: Contributed to the conception of the paper, assisted in the drafting of the manuscript: 10% Haines, T: Contributed to the conception of the study, assisted in the drafting of the manuscript: 5% Molloy, E: Contributed to the conception of the study, assisted with data synthesis, assisted in the drafting of the manuscript: 5%;	N
8	Challenging assumptions on peer-assisted learning in clinical education.	Under review <i>Advances in Health Sciences Education</i>	Led the conception of the study, undertook data collection, led data analysis & synthesis, drafted and prepared the manuscript for publication; 70%	Haines, T: Contributed to the conception of the study, assisted in the drafting of the manuscript: 15% Molloy, E: Contributed to the conception of the study, assisted with data synthesis, assisted in the drafting of the manuscript: 15%;	N

I have renumbered sections and reformatted referencing style of submitted or published papers in order to generate a consistent presentation as well as a consolidated reference list within the thesis.

Student signature: 

Date: 10th October 2016

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-authors' contributions to this work. In instances where I am not the responsible author I have consulted with the responsible author to agree on the respective contributions of the authors.

Main Supervisor signature: 

Date: 10th October 2016

Acknowledgements

This research program truly was a team effort.

I am proud to reflect and acknowledge that we have conducted two high quality studies with novel and robust experimental designs, including the first published randomised controlled trial in clinical education, and did so without additional resources. That required, not just a team, but a 'village' of people willing to work together for a common goal. Peer learning is not only the topic of this thesis, but was also a central strategy utilised by the research team in order to complete the trials. To all the students, clinical educators, student co-ordinators, managers, directors, staff and academics who supported me, thank you. I would also like to express my gratitude to Monash Health for supporting their staff to be involved in this research program, and also for supporting me individually through the Emerging Researcher fellowship, flexible work arrangements and study days.

My supervisors, Associate Professor Elizabeth Molloy and Professor Terry Haines, have provided guidance and direction, to take this from an idea for a local project through to PhD and beyond. I am thankful every day that I have such inspirational people to lead me. Thank you to my fellow PhD candidate colleagues at Monash Health, in particular Mel Farlie, who understand the juggle of work and study in public health and have been a great support.

Balancing work, study and a young family has been a challenge. This thesis would not exist without the incredible support of my husband, children, Mum, Mother- and Father-in-law and sister, who have provided care, distraction, comfort, focus and encouragement in the right moments.

Oral presentations by candidate

Sevenhuysen SL, Nickson W, Farlie MK, Raitman L, Keating JL, Molloy E, Skinner E, Maloney S and Haines TP. (2011). The development of a peer assisted learning model for the clinical education of physiotherapy students. Australian Physiotherapy Association Conference. Brisbane, Australia.

Sevenhuysen SL, Nickson W, Farlie MK, Raitman L, Keating JL, Molloy E, Skinner E, Maloney S and Haines TP. (2012). The development of a peer assisted learning model for the clinical education of physiotherapy students. Australian Collaborative Education Network Conference. Geelong, Australia.

Sevenhuysen SL, Nickson W, Farlie MK, Raitman L, Keating JL, Molloy E, Skinner E, Maloney S and Haines TP. (2013). Educators and students prefer traditional clinical education to a peer-assisted learning model, despite similar student performance outcomes a randomised trial. Australia and New Zealand Association of Health Professional Educators Conference. Melbourne, Australia.

Sevenhuysen SL, Nickson W, Farlie MK, Raitman L, Keating JL, Molloy E, Skinner E, Maloney S and Haines TP. (2013). Educators and students prefer traditional clinical education to a peer-assisted learning model, despite similar student performance outcomes a randomised trial. Australian Physiotherapy Association Conference. Melbourne, Australia.

Sevenhuysen SL, Thorpe J, Barker LA, Keating JL, Molloy E. (2014). Education in peer learning for allied health clinical educators: a mixed methods study. Australia and New Zealand Association of Health Professional Educators Conference. Brisbane, Australia.

Sevenhuysen SL, Haines TP, Molloy E. (2016). The role of the teacher in facilitating peer-assisted learning in the clinical setting in health professions education: A multi-phased mixed methods study. International Association of Medical Education Conference. Barcelona, Spain.

List of publications

Publications by candidate incorporated into the thesis:

Published

Sevenhuysen SL, Nickson W, Farlie MK, Raitman L, Keating JL, Molloy E, Skinner E, Maloney S and Haines TP. (2013). The development of a peer assisted learning model for the clinical education of physiotherapy students. *Journal of Peer Learning*, 6(1).

Sevenhuysen SL, Nickson W, Farlie MK, Raitman L, Keating JL, Molloy E, Skinner E, Maloney S and Haines TP. (2014). Educators and students prefer traditional clinical education to a peer-assisted learning model, despite similar student performance outcomes a randomised trial. *Journal of Physiotherapy*. <http://dx.doi.org/10.1016/j.jphys.2014.09.004>

Sevenhuysen SL, Farlie MK, Keating JL, Molloy E, and Haines TP. (2015). Physiotherapy students and clinical educators perceive several ways in which peer-assisted learning could improve clinical placements: a qualitative study. *Journal of Physiotherapy*.
<http://dx.doi.org/10.1016/j.jphys.2015.02.015>

Sevenhuysen SL, Keigaldie D, Molloy E, and Haines TP. (2016). Implementing collaborative and peer-assisted learning in clinical education. *The Clinical Teacher*. 13:1-7.

In Press

Sevenhuysen SL, Thorpe J, Keating JL, Molloy E, and Haines TP. (2016). Peer Assisted Learning in education of Allied Health Professional students in the clinical setting: a systematic review. *Journal of Allied Health*.

Under review

Sevenhuysen SL, Thorpe J, Keating JL, Barker LA, Molloy E, and Haines TP. Education in peer learning for allied health clinical educators: a mixed methods study. (*Focus on Health Professional Education*).

Sevenhuysen SL, Molloy E, and Haines TP. Challenging assumptions on peer-assisted learning in clinical education. (*Advances in Health Sciences Education*).

List of tables

Chapter 1

Table 1. 1 Characteristics of included studies.....	40
Table 1. 2 Advantages and Disadvantages extracted from included articles	44
Table 1. 3 Recommendations for engaging with peer-assisted learning.....	45

Chapter 3

Table 3. 1 Clinical educator demographics	69
Table 3. 2 Original and revised clinical educator workshop objectives	71
Table 3. 3 The peer assisted learning model	72
Table 3. 4 Clinical educator self-rated confidence to facilitate components of peer assisted learning..	74

Chapter 4

Table 4. 1 The peer assisted learning (PAL) model	83
Table 4. 2 Participant demographics	87
Table 4. 3 Student performance outcomes as measured by the APP.	88
Table 4. 4 Educator workload statistics.	89
Table 4. 5 Educator survey results for each model at the end of intervention.	90
Table 4. 6 Student placement profile	91
Table 4. 7 Student satisfaction results for each model at the end of intervention	92
Table 4. 8 Student perceptions of peer-assisted learning model at the end of both units.....	93

Chapter 5

Table 5. 1 Participant demographics	101
---	-----

Chapter 6

Table 6. 1 Participant demographics	118
Table 6. 2 Education session evaluation results.	120
Table 6. 3 Clinical educator survey results.....	121
Table 6. 4 Student Activity Record results	122
Table 6. 5 Qualitative themes and sub-themes from the survey and focus groups.....	124

Chapter 8

Table 8. 1 Clinical educator demographics (stage 1)	142
Table 8. 2 outcome measures used and relationship to assumptions	147
Table 8. 3 Summary of participants (stage 2)	150
Table 8. 4 Clinical educator workload statistics.....	152
Table 8. 5 student activity.....	154
Table 8. 6 results summary	158

List of figures

Chapter 1

Figure 1. 1 Search Strategy	34
Figure 1. 2 Inclusion and exclusion criteria.....	35
Figure 1. 3 Data extracted from included articles	36
Figure 1. 4 Flow of studies into the review.....	37

Chapter 2

Figure 2. 1 Research timeline.....	56
------------------------------------	----

Chapter 3

Figure 3. 1 Clinical educator workshop attendance and ‘usefulness’ rating	70
---	----

Chapter 4

Figure 4. 1 Trial Design.....	81
-------------------------------	----

Chapter 6

Figure 6. 1 Study design	115
Figure 6. 2 The PAL education session learning objectives	116
Figure 6. 3 Participant flow-chart.	119

Chapter 7

Figure 7. 1 Continuum of PAL activity in the clinical setting.....	132
--	-----

Boxes

Box 7. 1 Examples of types of PAL in the clinical setting	131
Box 7. 2 suggested PAL activities and prompts for students	133
Box 7. 3 suggested frameworks for students to guide PAL	136
Box 7. 4 Orientation to PAL purpose and process	137

Chapter 8

Figure 8. 1: Concerns regarding the implementation of PAL in clinical education..... 145

Figure 8. 2: Student performance outcomes, peer-assisted vs tradition model. 150

List of appendices

Appendix	Description
A. Ethics approvals	Copies of HREC approval letters and participant information
B. Tools used in the PAL model	Examples of the tools used in the PAL model <ul style="list-style-type: none"> • SNAPPS • Peer observation record • Complexity Risk Matrix
C. Data collection templates	Examples of the templates developed during the model development phase to record educator and student activity.
D. Surveys	Copies of the survey questions used
E. Focus Group Schedules	Copies of the focus group schedule and discussion prompts
F. Resources Developed	Examples of the resources developed throughout the research program <ul style="list-style-type: none"> • PAL workshop slides & session outline • PAL online clinical supervision training module • PAL online learning module offered as an elective unit as part of the Masters in Health Professional Education at Monash University
G. Publications Prior to Candidature	Copies of publications prior to candidature.

Chapter 1: Introduction

1.1 Background

Peer assisted learning (PAL) is defined as “people from similar social groups, who are not professional teachers, helping each other to learn and by so doing, learning themselves” (Topping & Ehly, 1998, p.1). Peer assisted learning is an ‘umbrella term’ which includes peer tutoring, feedback, observation, monitoring, modelling, coaching and assessment. The proposed benefits of PAL are supported by cognitive development theories and it is an educational strategy which has been utilised and researched extensively within the classroom setting (Topping & Ehly, 1998; Topping, 1996; Boud et al., 2001). In Hattie’s (2008) meta-analyses, peers were shown to have a more positive influence on educational outcomes than simulation, testing, computers and many other learning approaches.

1.1.1 Theory informing PAL

In the clinical placement environment, learning is based around experiences. The workplace constitutes a social learning environment and the people within it create a community where practice takes place, and evolves over time. Understanding of PAL in the clinical workplace can be enhanced through examining the activities and interactions through the lens of educational theories (Nestel and Bearman, 2015). Theories of social learning, experiential learning, workplace learning and communities of practice all have the potential to illuminate why and how some PAL practices occur, and to what effect. Kilminster and colleagues (2011) describe the transition from classroom based learning to clinical practice as a ‘critically intensive learning period’. These theoretical perspectives and their relationship to PAL will be expanded on in the following section. The relationship between these theoretical perspectives and the study methods chosen is discussed in chapter 2. Finally, the use of theories in interpreting the qualitative data from the studies is presented in the results and discussion chapters.

Social Learning Theory

Social learning theory posits that social interaction plays a fundamental role in the process of cognitive development (Bandura, 1971). It views learning as a process which transpires through learners’ active engagement in all of the influences and interactions that occur in the learning environment. The presence of peers, and activities specifically designed to bolster peer engagement in the workplace, are both likely to have an enriching influence on learner development.

Learning through observation is fundamental to social learning theory (Bandura, 1971). Processes of observation and imitation are central to a large portion of the learning that takes place over an individual's life (Billett, 2016). Observing others heightens awareness of one's own performance, through comparison and contrast (Topping and Ehly, 1998). This is an area which can also be enriched by the presence of peers, both by affording additional opportunities for observation of practice and by making sense of observations through discussion. Observing a fellow peer's success or mastery can also motivate the observer to try the task themselves (Schunk, 1998).

Vygotsky's (1978) concept of the "zone of proximal development," can also be applied to peer learning. A student can learn from another through 'scaffolded' social interaction as long as it is within the scope of the individual's existing competence or readiness (i.e. their zone of proximal development). Activities outside this scope (or zone) can lead to limited or negative outcomes (Billett, 2016) and therefore expert guidance is an important component in ensuring that peer learning activities are selected appropriately.

Experiential Learning Theory

It is widely recognised in the health professions that learning through experience in the authentic practice environment is valued by students, clinicians and academics (Ernstzen et al., 2009; Ryan et al., 1996; Speech Pathology Association, 2005; World Confederation of Physical Therapy, 2011). This approach where immersion is privileged is supported by experiential learning theory, which has been described as "the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p. 41). According to Kolb's four-stage learning cycle (Kolb, 2015), immediate or concrete experiences are the basis for observations and reflections. These reflections allow knowledge to be attributed to the experience and implications for future performance can be determined. These can be applied to future situations, where further experiences take place, and performance is enhanced. It is possible that learning with peers in the workplace environment may add value within this learning cycle. Discussion between peers may enable opportunities for reflection on experience and aid the process of reflection itself. Peers may also assist one another to identify and apply the relevant and appropriate knowledge (theory) to an experience (practice).

Although Kolb's model provides "an excellent framework for planning teaching and learning activities" (Tennant, 1997) it has been criticised for being too simplistic. Contemporary researchers have claimed that the model pays insufficient attention to reflection, does not take into account the situated nature of learning and that the learning itself is too focussed on the production of knowledge (Smith, 2010). In attending to these limitations in the model, Jarvis (1995) used Kolb's model to further explore the process of learning in context and demonstrated that there are a

number of responses to a potential learning situation. Jarvis added notions of 'non-learning' and 'non-reflective responses' and highlighted that a number of processes can occur at once. He also challenged the linear, sequential nature of the stages as posited by Kolb.

Workplace Learning Theory

In many health professional courses, a significant proportion of learning is conducted in the clinical or workplace environment. The authentic activities, interactions and cues provided by the clinical setting help learners to build the kinds of knowledge required for effective health care work, in ways that classroom-based experiences alone cannot (Billett, 2001). In his 2016 paper, Billett proposes four premises for understanding learning through work:

1. Learning is not reserved for, or necessarily enhanced by, intentional educational experiences.
2. As practitioners engage in work activities they also 'remake' and potentially transform their professional activities.
3. Engagement with the workplace environment is required for effective learning to take place. This engagement arises through everyday thinking and acting through work, and emphasises that an individual's learning and development are personally mediated.
4. Learning and development are two separate, but mutually informing, processes. Positioning learners as "meaning-makers and constructors of knowledge" (Billett, 2016, p 126) is central to supporting learning through clinical practice.

In relation to the first premise, PAL may offer more opportunities for informal learning in addition to a variety of intentional or facilitated PAL approaches. In the current climate of fiscal restraints, peers are likely to be more accessible than experts or clinical educators in the workplace. It is not only novel experiences that can lead to development of further clinical capacities. Routine or familiar clinical activities can also lead to more effective practice through honing and refining procedures and discussions relating to clinical reasoning (Billett, 2016). The presence of peers may provide more opportunities for learners to be involved in both novel and routine clinical activities that help build knowledge.

In relation to the third and fourth premises, PAL is reported as an educational approach that increases learner engagement (Topping and Ehly, 1998). In addition to offering increased opportunities for involvement in clinical activities, observing peers undertake tasks can build understanding of standards of work (Tai et al., 2016), and can also motivate students to participate (Schunk, 1998). Through peer discussion, opportunities to position learners as "meaning-makers"

may be enhanced (although we acknowledge that meaning making can also occur as an internal process).

Communities of Practice

Students learning together whilst participating in clinical placements aligns with Wenger's (2006) concept of a Community of Practice. Communities of practice are formed by people who engage in a process of collective learning in a shared domain (Wenger, 2006). Three characteristics are reported to be important:

1. A shared domain of interest: members value a shared competence and learn from each other.
2. A shared community: members engage in joint activities and discussions, help each other, and share information.
3. A shared practice: members engage in the sharing of experiences, stories, tools, ways of addressing recurring problems.

As a form of collaborative learning, PAL is likely to occur informally within a community of practice. Intentionally facilitating PAL between students, particularly early in clinical placements, may help establish communities of practice by bringing learners together and providing them with cues to build relationships. Engaging in practice with peers in a community of practice is also an efficient means of learning. Lave & Wenger (1991) noted that, where a task was able to be distributed amongst peers, this was achieved more efficiently than if the exchange occurred between expert and learner alone.

In most clinical settings there are a range of health professionals, from novice to expert, as well as students at various stages in their clinical placement journey. Lave & Wenger (1991) describe newcomers or novices at the beginning of their clinical learning as being at the periphery of a community and their first roles being observing and performing basic tasks. Through participation, active engagement and assuming increasing responsibility, learners acquire the roles, skills, norms and values of the community (Mann, 2011). Peer assisted learning may afford opportunities for students to begin their 'legitimate peripheral participation' and to actively engage in learning activities in the clinical setting.

Critically intense learning periods

The transition from classroom-based learning to the clinical placement environment could be considered a "critically intensive learning period (CILP)" (Kilminster et al., 2010). Learner performance during a CILP is determined not only by preparedness for the transition but also significantly by situational and contextual factors in the learning environment (Kilminster et al.,

2011; Kilminster et al., 2010). Learning occurring within a transition is “enmeshed with responsibility and risk and is integral to practice” (Kilminster and Zukas, 2013; p 391). The presence of peers and the utilisation of PAL as an education strategy is one of the many situational and contextual factors which may affect learning and performance. Including PAL alongside other evidence based strategies within a framework for clinical education practice may help to support students during this crucial time.

Summary

The theories outlined support the use of PAL as an educational approach in the clinical environment. They are also likely to illuminate aspects of PAL (both processes and outcomes) that may not be visible unless scrutinised through such a framework of ideas (Nestel and Bearman, 2015). Clinical education occurs in busy, complex workplaces and the learning is situated in nature. The presence of peers could enhance opportunities for social interaction, active engagement, observation, discussion, and reflection on practice. Peer assisted learning may enhance the development of a shared “community of practice” and assist learners in this critical transition from student to practitioner.

1.1.2 From the Theoretical to the Practical

Despite promising results in classroom based settings, the uptake of PAL in the clinical setting in Allied Health Professional education has been limited. Research in this area to date has largely focussed on the multiple student: clinical educator allocation model, rather than the PAL approaches which may be utilised within these models. The following section provides further background on the current research pertaining to PAL in the clinical practice setting. It aims to describe how PAL may be applicable and demonstrates the need to separate PAL as an educational approach from multiple student: clinical educator allocation models.

1.1.3 PAL in Allied Health Professional Clinical Education

Health professional students are challenged by clinical education (Laitinen-Vaananen et al., 2007) and report feeling under-prepared for the demands of the practice environment (Katinka et al., 2005). Peer assisted learning may enhance the learning opportunities for students by adding peer feedback to that provided by the clinical educator, and potentially the patient (Boud and Molloy, 2013; Kent and McKenna, 2013). Peer assisted learning may also provide opportunities for explicit discussion of decision making processes and enable sharing of challenges to ‘normalise’ the perception of difficulty in adjusting to learning in a challenging environment (Secomb, 2008, Skøien et al., 2009). In addition to the potential for increasing student satisfaction with clinical education, PAL has the potential to increase capacity for workplace education by creating a framework for education of students in a ‘multiple student to educator’ ratio.

Studies that have measured student performance in both the pre-clinical and clinical environment have concluded either similar or positive effects compared to traditional approaches (Moore et al., 2016; Bosse et al., 2010; Peets et al., 2009; Tolsgaard et al. 2007; Koles et al., 2005; Ladyshevsky, 2004; Ladyshevsky, 2002; Farrow et al., 2000; Nnodim, 1997; DeClute and Ladyshevsky, 1993). Learning in groups with less direction from supervisors may promote students' autonomy and improve their teaching and evaluative judgement skills (Baldry-Currens & Bithell 2003; Secombe 2008; Wood 2003; Boud et al. 2001). Tai and colleagues (2015) defined evaluative judgement as "the ability to critically assess a performance in relation to a predefined but not necessarily explicit standard, which entails a complex process of reflection". It encompasses both self-evaluation and the evaluation of the performance of others and is a life-long skill crucial in professional learning.

Despite reported benefits, educators and students have concerns about the use of peer assisted learning (Lekkas et al. 2007; Krych et al. 2005; Weyrich et al. 2008; Lincoln & McAllister 1993). Issues commonly raised by educators are student competitiveness and compatibility and that there is no regulation of information shared between peers. Students report fear that they will not receive sufficient supervision or teaching, and question what value their peers can add to their learning when compared with the advice of an 'expert' clinical educator.

Given the emphasis on group work in pre-clinical curricula, students are accustomed to PAL and it is likely that they will seek out and engage in informal PAL whilst on placement to varying degrees (Tai et al., 2014). The degree to which PAL is actively facilitated may depend on the experience, confidence and training of the clinical educator. The role of the clinical educator is consistently identified as complex, stressful, and time intensive (Kilminster and Jolly, 2000; Higgs and McAllister, 2007; Sevenhuysen and Haines, 2011; Bearman et al., 2012). With the demands placed on clinical educators, student peers may be more accessible to one another and formalising and enhancing PAL activities may relieve some of the burden from clinical educators whilst also helping students to capitalise on their learning experiences.

In the health professions, students must be work-ready at the point of graduation. Health practitioners deliver interventions that carry risk of harm e.g. testing swallowing ability of a stroke patient carries the risk of aspiration; rehabilitating mobility carries the risk that the patient might fall; manual handling techniques must be adjusted to minimise risk of harm to both the practitioner and patient. Perhaps because of these risks and responsibilities in care delivery, clinical educators tend to supervise students vigilantly (Bearman et al., 2012) and traditionally in a one to one educator to student ratio (Lekkas et al., 2007). With health professional student numbers increasing world-wide, appropriate clinical education is increasingly difficult to source and provide (Rodger et

al., 2008). Universities and health services might benefit from a 'multiple student to clinical educator' model if this could be achieved without compromising placement quality. However, there is little high-level evidence supporting effective and acceptable methods of clinical education when clinical educators have concurrent responsibility for more than one student in the workplace.

Empirical evidence of effects of various 'multiple student to educator' models utilised in the clinical setting on student, educator and patient outcomes is limited (Lekkas et al., 2007; Moore et al., 2003; Roberts et al., 2009, Strohschein et al., 2002). Qualitative investigations have concluded that the company of another student on placement reduces student anxiety and aids learning (Baldry-Currens, 2003, DeClute et al., 1993; Skøien et al., 2009). However, no reports provide a structure, reproducible framework or specific tools that enable objective measurement of the effects of PAL on learning outcomes in clinical placements. A systematic review of 12 (mainly qualitative) studies of clinical education of health science students by Secomb (2008) concluded that learning outcomes were enhanced by peer teaching and learning. There was little description or evaluation of the amount or type of peer assisted learning in the included studies. The effects of peer support on learning outcomes is likely to be influenced by many factors, including how the program is actively facilitated, and prior (including pre-clinical) initiatives that create a context that enables peer learning (Boud, 1999).

The popularity of the 2:1 or 'paired' model - where two students are supervised by one clinical educator - is growing in health professional education. In theory, the paired model offers an immediate increase in capacity compared to the 1:1 model traditionally used in clinical placements. However, evidence of the actual effects of paired student models on student, educator and patient outcomes is limited (Blakely et al., 2009; Lekkas et al., 2007; Moore et al., 2003; Roberts et al., 2009; Strohschein et al., 2002) and no randomised trials examining this question have been published at the time of this report. Clinical educators consider the paired student model feasible (Baldry-Currens & Bithell, 2003; Lekkas et al., 2007; Moore et al., 2003) and some prefer this to the 1:1 model (Baldry-Currens & Bithell, 2003). Some authors present recommendations for implementation of the paired student model and reference the need for clinical educators to be prepared to facilitate peer engagement. Despite the recommendation for paired model implementation, no studies have provided a reproducible framework, set of activities, documented learning objectives or specific tools to assist educators and learners in applying the model.

1.1.4 Implementation of PAL within the 2:1 model in the clinical setting

Peer assisted learning may or may not occur naturally in a 2:1 model. The literature frequently highlights the importance of establishing the expectations of collaboration, communication and

cooperation with those operating in a 2:1 model (Bartholomai and Fitzgerald, 2007; Dawes and Lambert, 2010; Farrow et al, 2000; Flood et al, 2010; Martin and Edwards, 1998; Martin et al, 2004; Moore et al, 2003). Students require “explicit teaching” by clinical educators in the skills of delivering constructive feedback, ‘turn-taking’ and reflective practice (Sussman et al., 2007). There is also a need for education of the clinical educator in both the theory and application of PAL to enhance confidence in using the model, address concerns relating to the model’s disadvantages, and facilitate best use of a clinical educator’s time (Baldry-Currens and Bithell, 2003). However, little is known as to whether engaging clinical educators in PAL education will impact on what learning activities students are exposed to, or whether it will enhance the education experience for the student or educator.

Implementation of paired student placements might also vary for a number of reasons such as student preparation, placement environment and the cohesion of the student peer relationship (Baldry-Currens & Bithell, 2003; Boud, 1999; DeClute & Ladyshevsky, 1993; Lekkas et al., 2007; Merrill, 2009; Skøien et al., 2009). Peer interactions may take place in a number of ways from social support to formalized peer assisted learning tasks. A model of paired student clinical education which specifically aims to facilitate peer assisted learning may not only present immediate benefits within the placement; it may also help to develop more sustainable and productive learner behaviours (Leach & Fletcher, 2008). The ability to collaborate with peers is highly valued by workplaces (Sampson et al., 1999) and is particularly important in the provision of effective health care (WHO, 2010).

1.2 Systematic literature review

The following text is adapted from a published article by Sevenhuysen SL, Thorpe J, Keating JL, Molloy EK and Haines TP. (2016). Peer Assisted Learning in education of Allied Health Professional students in the clinical setting: a systematic review. *Journal of Allied Health*.

1.2.1 Research Questions

1. How is PAL, between students of the same year level and same profession, utilised in allied health within the clinical setting?
2. What is the effect of PAL on student, educator and health service outcomes?
3. What recommendations can be made to optimise these outcomes?
4. How has PAL been defined and measured within this practice setting?

1.2.2 Method

Search

The search strategy is detailed in Figure 1.1. Electronic searches of five databases, Medline, PschINFO, CINAHL Plus, ERIC and Scopus were carried out. Duplicate citations, non-journal articles and those that pre-dated 1985 were removed. The remaining citations were reviewed by the lead researcher to assess the text of the title, key words and where unclear, the abstract, for relevance to the current investigation. If the lead researcher was unsure, the citation progressed to the next phase, where inclusion and exclusion criteria were applied independently by two authors (S.S and J.T.). If there was lack of consensus a third researcher (T.H.) was invited to review the paper. Electronic searches were supplemented by hand checking the reference lists of any relevant identified articles.

("peer*" or "collaborative" or "cooperative" or "2:1" or "pair") and
("clinical" or "placement" or "fieldwork" or "practicum") and
("student*" or "undergraduate" or "professional entry" or "entry level" or "novice" or "learner") and
("physiotherapy" or "physical therap*" or "occupational therap*" or "social work*" or "speech patholog*" or
"speech therap*" or "dietetician" or "dietitian" or "dietetic*" or "podiatr*" or "audiolog*" or "allied" or
"language therap*" or "psychol*")

Figure 1. 1 Search Strategy

Participants

Studies involving students from allied health professions undertaking education in the clinical setting were included.

Interventions

Studies that involved PAL within 'multiple student' to 'single clinical educator' clinical placement models were included.

Inclusion/Exclusion Criteria

Figure 1.2 summarises the inclusion and exclusion criteria used in this review. Only models which comprised of students in the same year level and same profession were included as this is most commonly seen in allied health professional student education specifically in the clinical setting. It

also ensured that a group of similar PAL approaches were being collected within the review to enable meaningful comparison and recommendations for implementation. Studies involving medical or nursing students or interprofessional approaches were also excluded for this reason. The review required that included studies report on any form of outcome of the PAL intervention. Outcome measures included competency and/or learning outcomes, productivity outcomes, changes to self-reported confidence levels, changes to the activities undertaken on clinical placement, and student or clinical educator perceptions.

INCLUSION CRITERIA	EXCLUSION CRITERIA
Subjects must be allied health professional students (Audiology, Dietetics, Occupational Therapy, Physiotherapy, Podiatry, Psychology, Social Work and Speech Pathology)	Nursing, medicine students
Subjects must be of the same profession and same year level	Not of the same year level e.g. peer tutoring, peer teaching
There must be an intervention that involves peer-assisted learning, including multiple student models e.g. 2:1, 3:1	Inter-professional learning; PBL's/tutorials
Outcomes of the intervention must be reported	Full text unavailable
Setting must be clinical	University setting
Published in English	

Figure 1. 2 Inclusion and exclusion criteria

Data Analysis

Figure 1.3 summarises the data that were extracted from included articles. Data extraction targets are reported in Table 1.1. Information was extracted from included studies using a customized data extraction form. Data extraction was completed by one author and reviewed by a second author (S.S. and J.T.). Meta-analysis was planned if more than one included study reported comparable comparisons and outcomes. Summative content analysis (Hseih and Shannon, 2005) was conducted to compile a list of advantages, disadvantages and recommendations (Tables 1.2 and 1.3). Two authors (S.S. and J.T.) independently identified and quantified content within the included articles relating to advantages, disadvantages and recommendations with the purpose of summarising the contextual use of the content. Thematic analysis (Miles et al., 2014) was then conducted on the

extracted content. An extended analysis framework was developed cooperatively. Codes were cross-checked, adjusted and condensed to reflect key themes in the data.

Characteristics of the student and clinical educator population
Setting
Design of the study
Sample size
Ratio of students to clinical educator
Training in peer-assisted learning prior to placement
Description of the intervention
Measurement of peer-assisted learning
Description of peer-assisted learning facilitated
Outcome measures used
Outcomes reported
Advantages
Disadvantages
Recommendations

Figure 1. 3 Data extracted from included articles

Risk of bias within the selected studies

The risk of bias within the included studies was assessed by two reviewers independently (S.S. and J.T., see Table 1) using an indicator tool developed by Buckley et al. (2009). The tool has 11 items each scored 1 or 0; these relate to the appropriateness of the study design (e.g. controlling of confounding variables), methods (e.g. reproducibility, triangulation) and results (e.g. drop-out rates, statistical approaches used). Any discrepancies in risk of bias ratings between reviewers were resolved by discussion.

1.2.3 Results

Figure 1.4 details the selection process. Twenty-eight articles met the final inclusion criteria. Table 1.1 summarises design features in the included studies.

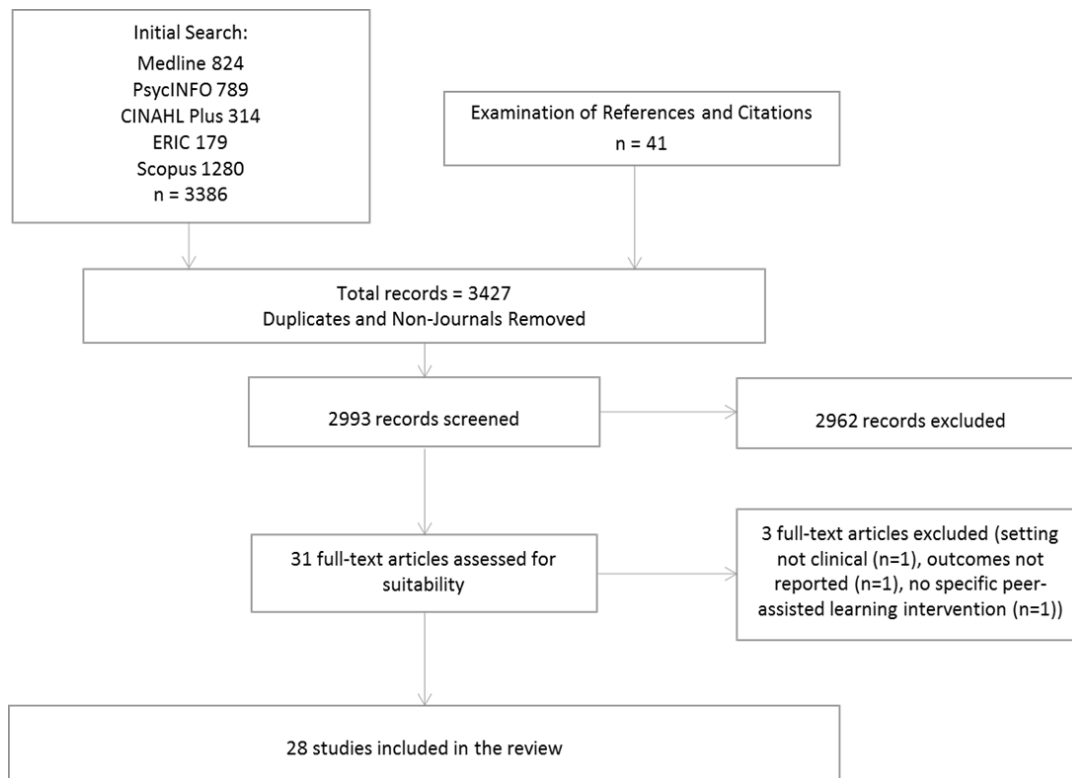


Figure 1. 4 Flow of studies into the review.

Study and Risk of Bias Rating (0-11)	Study Design	Participants and Sample Size	Ratio (Student: CE)/ Terminology	Facilitation of PAL	Measure of PAL occurring	Method: Outcome measures
Avi-Itzhak & Kellner 1995 (6)	Case series: post-test quantitative and qualitative	OT (n=25), 2nd and 3rd year	2:1, 3:1, or group supervision	Supervision plans (not described) for 1:1 and group supervision	Number of hours of 1:1 and group supervision	Likert scale: student perceptions and evaluations of PAL
Baldry-Currens & Bithell 2003 (10)	Case series: post-test questionnaire	PT (n=61), 1st, 2nd and 3rd year; CEs (n=29)	2:1	Nil	Nil	Questionnaire and interviews: perceptions and experiences of CEs and students
Bartholomai & Fitzgerald 2007 (3)	Case series: post-pilot description	OT (n=9), 3rd and 4th year; CE (n=1)	3:1/ collaborative model	Joint induction, timetabled PAL, PAL activities and supervision sessions; staff meetings to discuss collaboration strategies; student room to promote peer learning	Caseload allocations	Authors perceptions of model
Blakely et al. 2009 (3)	Case series: post-pilot interview	OT (n=2); CE (n=1)	2:1	Joint induction; timetables planned for joint and individual supervision	Nil	Questionnaires: student perceptions
Bruce et al. 2001 (1)	Case series: post-pilot description	SPT (n=not disclosed), final year	2:1	Structured supervision sessions with a 3 stage progression facilitating reflective practice	Nil	Written reflections: student experience
Classen 2004 (4)	Case series: post-pilot evaluation	SPT (n=2), 1st year; CEs (n=2)	2:2/ reciprocal peer coaching	Strategic caseload delegation (joint and individual patients); placement objectives included peer goals; planned joint and individual supervision times;	Nil	Student and CE perspectives on experience
Dawes and Lambert 2010 (10)	Case series: post-test interviews and focus groups	OT, PT, SPT (n=13)	2:1	Nil	Nil	Interview: educator perceptions on 2:1 experience
DeClute et al. 1993 (8)	Retrospective cohort comparison	PT (n=38), 3rd year; CEs (n=19)	2:1/ collaborative learning	Nil	Nil	Competency ratings

Farrow et al. 2000 (6)	Retrospective cohort comparison	OT (n=26); CEs (n=28)	2+: 3+/ group model of supervision	CEs met regularly to discuss facilitating group supervision; student meetings timetabled to promote support and shared learning	Nil	Questionnaires: student skill development, student and clinical educator perceptions
Flood et al. 2010 (3)	Case test: post-pilot description	OT (n=1), final year; CE (n=1)	3:1/ collaborative education model	CEs trained in collaborative learning	Nil	Reflections: CE
Fosnaught 1996 (3)	Case test: post-pilot questionnaire	PT (n=1), final year; CE (n=1), clinical coordinator (n=1)	3:1	CE and student trained in collaborative education processes	Nil	Reflections: CE, student and clinical coordinator
Kell and Owen 2009 (7)	Case series: post-test questionnaire	PT (n=90), 3rd year	2:1 and 3:1	Nil	Nil	Questionnaires: student learning approaches Statistics: CE activity (proportion of time supervising, teaching, completing administration); Questionnaire: CE and student perceptions
Ladyshevsky 1993 (6)	Mixed methods post-test study	PT (n=38) 3rd year; CEs (n=38)	2:1	CEs trained in collaborative supervision	Nil	
Ladyshevsky & Gardner 2008 (9)	Case series: post-test	PT (n=38)	group model	Blogging group required online collaborative student participation	Nil	Open inquiry: student perceptions
Ladyshevsky 1995 (6)	Retrospective case control	PT (n=16), 3rd year; CEs (n=8)	2:1/ teaching model	Nil	Nil	Workload measurement system: productivity of the CE, student team
Ladyshevsky et al. 1998 (7)	Historical control study	PT (n=38) 4th year; CEs (n=32)	2:1/ cooperative learning	Joint goals, shared learning encouraged (non-specific) for collaborative placement	Nil	Productivity: changes in patient throughput and amount of patient care given; student grades; student perceptions
Martin & Edwards 1998 (6)	Case series: post-test questionnaire	OT (n=14); CE (n=1)	2:1/ cooperative learning	Nil	Nil	Questionnaire: student perceptions
Martin et al. 2004 (10)	Prospective cohort study	OT (n=11); CEs (n=6)	2:1, 3:1	CE training in collaborative learning	nil	Interviews: CE and student perceptions
Mason 1998 (4)	Case series: post-test interviews and focus groups	OT (n=not disclosed)	2:1 to 6:1/ group model	"Collaboration ongoing" details not specified	Nil	Phone interviews, evaluation forms, focus groups: student and CE perceptions

Miller et al. 2006 (7)	Case series: field report	PT (n=4); CE's (n=2)	4:2/ collaborative learning	Nil	Nil	Questionnaires (pre, mid and post placement), reflective journals: student, CE and other non-teaching staff perceptions
Moore et al. 2003 (10)	Prospective cohort study	PT (n=48) final year; CEs(n=8)	2:1,3:1	CE trained in collaborative learning	Nil	Interviews: CE and student perceptions
Morris & Stew 2007 (9)	Case series: post-test interviews and focus groups	PT (n=18), 3rd year; CEs (n=13)	2:1/ collaborative model	Nil	Nil	Interviews and focus groups to measure student and CE perceptions of reflective learning in 2:1 model
O'Connor et al. 2012 (8)	Case series retrospective comparison	OT, PT (n=12), final 2 years of program; CEs (n=8)	2:1	Nil	Nil	Semi-structured interviews to measure student and CE perceptions of 1:1 and 2:1 models
Rindflecsh et al. 2009 (5)	Case series: post-test description	PT, OT (n= not disclosed)	2:1,3:1/ collaborative model	Examples of how CE facilitates collaboration described	List of typical activities recorded weekly for 9 weeks	Informal feedback and voluntary survey to measure student perceptions; total volume of billed therapy units per full time equivalent to measure productivity
Roberts et al. 2009 (5)	Historical control study	N&D (n=14)	2:1/ collaborative model	Tool and guidelines provided to CEs to assist with implementation of collaborative model	Nil	Surveys and debriefing sessions to measure CE and student perceptions of the experience; activity statistics: CE and student time spent in supervised tasks
Sussman et al. 2007 (6)	Case series: post-test interviews	SW (n=20); CEs (n=5)	3+:1 Supervision	Nil (CEs experienced in group supervision)	Nil	Long interviews to measure CE perspectives of group supervision
Tiberius & Gaipman 1985 (5)	Prospective cohort study	OT (n=20), 3rd and 4th year; CEs (n=5)	2:1	CEs discussed and planned 9 strategies to facilitate collaboration	Nil	Open interview to measure student perceptions
Triggs-Nemshick & Shepard 1996 (9)	Case series: post test	PT (n=6); CEs (n=3)	2:1	Nil	Activity List; observation log twice during placement	Student journal, student and CE interviews to measure perceptions; observation log to measure activities

Table 1. 1 Characteristics of included studies CE = clinical educator, PT = physiotherapy/physical therapy students, OT = occupational therapy students, SW = social work students, N&D = nutrition and dietetics students SPT = speech therapy students.

Student: clinical educator ratios and professions investigated

Peer assisted learning was most commonly investigated within the 2:1 model, followed by group models (four or more students co-located on placement) and then the 3:1 model . Typically a single allied health profession was studied, with physiotherapy and occupational therapy predominating. Three studies included more than one profession (Rindflesch et al., 2009; Dawes and Lambert, 2010; O'Connor et al., 2012).

Study design and sample size

Twenty-five of the studies were retrospective, leaving this body of literature open to potential sources of bias. Twenty-one studies had no control group and were therefore not able to differentiate outcomes related to peer-assisted learning from outcomes due to other factors such as clinical placement setting, time or experience level of the clinical educator, or maturation effects within students. Only nine of the 21 studies including qualitative data employed method triangulation to strengthen results. The sample size of the studies ranged from 1-90 (mean 17.56, SD 18.50). All but two studies used a convenience sample. Meta-analysis was not considered appropriate due to the range of study designs and diversity of outcome measurement approaches employed in the included studies.

Training in peer-assisted learning prior to placement

Seven of the 28 studies documented that clinical educators had received training in facilitating peer assisted learning.

Facilitation and measurement of peer-assisted learning

Ten studies indicated that PAL was facilitated, most commonly through the planned sharing of patients between peers, joint/group supervision and peer-to-peer feedback sessions. The occurrence of PAL was reported to have been measured in four studies. A student activity record was utilised twice (Triggs-Nemschick and Shepard, 1996; Rindflesch et al., 2009), although not with standardised or validated tools. Specific methods of PAL were measured twice: Bartholomai & Fitzgerald (2007) recorded caseload allocation (shared versus individual patient intervention) and Aviltzhak & Kellner (1995) recorded the number of hours of 1:1 versus group supervision; however the full range of possible PAL interactions were not represented.

Outcome measures used

Of the nine studies that included quantitative data, three measured productivity, three measured clinical educator or student activity data, one measured student competency outcomes, another measured perceived student skill development and a final study measured student learning styles. No studies reported any longitudinal outcomes or follow-up and none used a control group with the same participants as the intervention group.

Outcomes reported

In Ladyschewsky's 1995 study, productivity, measured with the amount (minutes) of patient care provided per worked hour (staff member and students), was greater when physiotherapy clinical educators (n=8) supervised students in the 2:1 model (mean 78.56 min/hr, SD 18.24 min/hr) compared with a no-student baseline (mean 39.56 min/hr, SD 10.49 min/hr). However, in a subsequent paper, Ladyschewsky and colleagues (1998) reported that productivity was greater compared to a no-student baseline in the 1:1 placement model (n=23, baseline mean 47 min/hr vs 1:1 mean 58 min/hr) but was similar compared to a no-student baseline in the 2:1 model (n=9, baseline mean 44 min/hr vs 2:1 mean 43 min/hr). No statistical significance testing was reported in either study. Rindfleisch et al. (2009) described the productivity (measured by total volume of billed therapy units in a month/full-time equivalent) of physical and occupational therapy clinical educators (n=28) using a collaborative model of clinical education (mean 620 billed therapy units in a month/full-time equivalent, SD 245 billed therapy units in a month/full-time equivalent) as greater than for other therapists (n=28) working in the same area without students (mean 358 billed therapy units in a month/full-time equivalent, SD 66 billed therapy units in a month/full-time equivalent) but no testing for significant differences between these outcomes was conducted.

Of the three studies (Ladyschewsky, 1995; Triggs-Nemschick and Shepard, 1996; Roberts et al., 2009) that measured clinical educator or student activity, two lacked comparison groups (Ladyschewsky, 1995; Triggs-Nemschick and Shepard, 1996) so only descriptive data were included. Roberts and colleagues (2009) reported that their PAL model of dietetics clinical education reduced the amount of clinical educator time spent in supervision per student hour on placement (mean 0.31 min/hr vs 0.26 min/hr) compared with previous years (mixed models) while maintaining stakeholder satisfaction indicators. However, confounding factors may have been present, such as differences in staff unpaid overtime per worked hour (mean 0.03 min/hr vs 0.04 min/hr) and no testing for statistical significance was conducted.

Physical therapy student competency outcomes were examined in one study. DeClute and Ladyshewsky (1993) completed a retrospective audit using the Evaluation of Clinical Competence form in 28 collaborative (2:1) and 80 individual (1:1) matched placements and demonstrated significantly enhanced results in the collaborative group (mean score 3.66 vs 3.42, $p = 0.01$). However, the characteristics of the participants in each group, the specific placement and the environmental variables were not controlled. Farrow and colleagues (2000) reported no significant difference in various components of perceived student skill development rated on a Likert scale by both students and educators. Kell and Owen (2009) investigated students self-reported learning styles ($n=90$), measured using the Approaches and Study Skills Inventory for Students half-way through a four-week placement. The subset 'Fear of Failure' score was significantly greater when there were more students sharing the placement ($p = 0.023$) and students on a 1:1 placement reported higher scores for deep learning ($p = 0.083$) variable scores.

Student and clinical educator perceptions

The majority of reports presented analyses of the perceptions of participants: clinical educators (18) and students (21). Our thematic analysis of the advantages and disadvantages reported in the included articles are summarised in Table 1.2. Two key themes emerged as advantages: enhanced student autonomy and learning, and mutual support provided by peers improving student confidence. Whilst sixteen articles reported that the multiple student: clinical educator model improved perceived clinical educator time efficiencies and productivity compared with the 1:1 model, twelve of these also reported on the additional time burden associated with duplicate feedback, documentation and assessment. Another five reported a perceived reduction in time efficiencies for the clinical educator compared with the 1:1 model.

	Avi-Itzhak 1995	Baldry-Currens 2003	Bartholomai 2007	Blakely 2009	Bruce 2001	Claessen 2004	Dawes 2010	DeClute 1993	Farrow 2000	Flood 2010	Fosnaught 1996	Kell 2009	Ladyshewsky 1993	Ladyshewsky 2008	Ladyshewsky 1995	Ladyshewsky 1998	Martin 1998	Martin 2004	Mason 1998	Miller 2006	Moore 2003	Morris 2007	O'Connor 2012	Rindfleisch 2009	Roberts 2009	Sussman 2007	Tiberius 1985	Triggs-Nemshick 1996	
Advantages																													
Enhanced student autonomy and learning	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mutual support between peers improving confidence	✓	✓		✓		✓	✓		✓	✓	✓		✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Clinical educator time and productivity benefits		✓							✓		✓			✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓
General positive experience	✓									✓	✓					✓	✓	✓	✓	✓	✓		✓	✓					✓
Enhanced student relationships/teamwork	✓	✓	✓						✓	✓	✓											✓		✓				✓	
Enhanced student feedback and self-reflection capability					✓					✓				✓				✓		✓	✓	✓		✓	✓	✓			
Clinical educator skill development							✓							✓								✓							✓
Practical benefits (such as sharing travel, accommodation)																	✓												
Disadvantages																													
Clinical educator time burden		✓			✓	✓	✓		✓		✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Destructive student-peer relationship		✓				✓			✓								✓		✓	✓	✓	✓	✓					✓	✓
Reduced quality of supervision					✓		✓										✓	✓	✓		✓	✓	✓				✓	✓	
Students at variable levels		✓																✓	✓	✓	✓	✓	✓	✓					✓
General negative experience	✓					✓			✓				✓								✓								✓
Strain on resources (physical, patient numbers)		✓																✓	✓		✓							✓	

Table 1. 2 Advantages and Disadvantages extracted from included articles using Thematic Analysis (Miles et al., 2014)

Recommendations for optimising peer-assisted learning

Various recommendations for engaging with PAL within multiple student: clinical educator models emerged from the included articles (Table 1.3). The majority of studies reported on the need for preparation in two key areas: training clinical educators and students in the theory and application of PAL, and ensuring adequate placement planning and student orientation.

Recommendation	Number of Articles that make the recommendation
Training in theory and application for clinical educator and student	12
Clinical educator preparation and student orientation	12
Need for clinical educator to actively facilitate peer-assisted learning between students	6
Student matching for level and learning style	6
Adequate support for the clinical educators (at department and university level)	4
Adequate and appropriate case load delegation to the students	4
Adequate individualised feedback	4
Plan for additional space and resource requirements	3
Clinical educators are flexible and open-minded	3
Open communication clinical educator-to-student and student-to-student	1

Table 1. 3 Recommendations for engaging with peer-assisted learning

1.2.4 Discussion

The overall risk of bias within the studies limits the ability to draw firm conclusions on the basis of the included work. The predominance of physiotherapy and occupational therapy and the fact that most studies only investigated a single discipline, coupled with small sample sizes, restricts the ability to generalise findings across other allied health disciplines. The effect of PAL on student competency outcomes, health service productivity and clinical educator and student activity remains unclear. Studies investigating clinical educator and student perceptions reported that PAL enhances learning opportunities and student autonomy, improves self-reflection and feedback skills, and that the mutual support afforded by the presence of a peer optimises student confidence. The following perceived disadvantages were also commonly found: reduced ability to deliver quality individualised supervision to each student; increased time burden associated with administration of the clinical placement; and destructive peer relationship issues (competition, variable abilities).

Whilst there was some agreement in findings, two key deficits in current investigations into peer-assisted learning impact on the ability to apply these findings to practice: PAL was poorly defined and the occurrence and effects of PAL were poorly measured. Most studies failed to describe PAL or evaluate whether collaboration between students was facilitated or occurred. Four studies made attempts to indicate how PAL was measured but with tools that have not been standardised or tested for reliability. No studies included objective measures to determine the occurrence of PAL within the multiple student: clinical educator model. The majority of the studies were qualitative and analysed participant perceptions of the multiple student model but without a standardised measurement tool. The reports failed to identify the effects on outcomes such as student competency, readiness for work, clinical educator burden and departmental productivity.

A number of studies (n=12) reported on the need for clinical educators and students to be provided with training in peer assisted learning. Clinical educators may need to develop specific supervision strategies to facilitate PAL in order to enhance outcomes (Tiberius and Gaipman, 1985; DeClute and Ladyshewsky, 1993; Baldry-Currens and Bithell, 2003; Rindflesch et al., 2009; Dawes and Lambert, 2010). Similarly, students may need to be trained in collaborative learning principles to optimise outcomes of PAL (Fosnaught, 1996; Mason, 1998; Farrow et al, 2000; Sussman et al., 2007). Despite consistently recommending training in PAL, only seven studies indicated that clinical educators were trained prior to taking multiple students and none reported on the training provided for students. Future trials of PAL that assess effects on student, patient or educator outcomes might consider methods for implementation and facilitating peer-assisted learning strategies. Peer assisted learning programs that are well defined and developed may still fail if their implementation is poor, which may explain some of the heterogeneity in our review findings.

Peer assisted learning may occur to varying degrees within the multiple student: clinical educator model and a difference between incidental and intentional PAL has been identified (Hemming et al., 2008). Incidental or unplanned PAL is a product of the safe learning environment that exists with the presence of a peer and results in opportunities for sharing ideas and practical skills. Intentional or planned PAL refers to specific teaching activities assigned to the pair or student group. Edmondson (1999) identified that learning in a team (or with a peer) facilitates positive learning behaviours such as seeking feedback, sharing information, asking for help, talking about errors and experimenting. It is likely that students placed in a multiple student: clinical educator model will benefit from the incidental kind of peer assisted learning. Students placed in a model where PAL is actively facilitated may benefit from both the planned and unplanned opportunities for learning. Understanding the

effects of the intentional and incidental aspects of PAL is required to establish a framework for best practice.

Poor definition, failure to evaluate the occurrence of PAL (intentional and incidental) and the lack of a standardised tool to measure the effects of PAL renders the original review question unanswered, although the review provides important insights into how PAL might be studied in future work. It is difficult to determine the components of a multiple student: clinical educator model that result in improved learning outcomes. As a consequence it is difficult to design and implement evidence-based training to educators and students alike. Despite decades of literature recommending PAL training, there is currently a lack of formal education and support available to assist allied health educators and students to capitalise on this learning strategy.

This review has highlighted the need for further research into the use of PAL across all allied health disciplines. The development of tools for evaluating and measuring the amount and type of PAL that occurs is required. Further efforts are also required to identify a standardised framework to measure the effects of PAL within a multiple student: clinical educator model. In turn, more studies must be carried out to evaluate the educational and departmental outcomes of the multiple student: clinical educator model. Elements identified that may be influenced by PAL including student anxiety, learning and performance, clinical educator workload and stress, and departmental productivity need to be measured in well-designed comparative studies. Concurrently, evidence-based training for clinical educators and students in the implementation of PAL should be developed to progress this field of education.

1.2.5 Conclusion

The multiple student: clinical educator model may offer one solution to the growing demand for allied health student clinical placements. The occurrence of PAL within the multiple student: clinical educator model may enhance learning opportunities for students and improve outcomes in clinical education. Included studies consistently reported overall positive experiences by clinical educators and students as well as some common disadvantages. In the absence of clear methods to measure the intervention and the outcomes, the evidence does little to equip clinicians with strategies to mitigate the challenges and maximise the benefits of the clinical education model and the PAL that may be fostered. Further robust experimental research in the area, including longitudinal study designs, may illuminate the potential in this educational approach.

1.3 Thesis proposal

1.3.1 Research questions

The specific research questions for this thesis are:

- What is the effect of facilitated PAL activities on student performance outcomes and satisfaction, and clinical educator workload and satisfaction, compared with traditional practice?
- What is the effect of training clinical educators in facilitating PAL in relation to student activity and clinical educator and student satisfaction?
- What are the recommendations for implementing PAL models of clinical education?

1.3.2 Research aims & approach

This thesis consists of three studies to investigate the research questions and address the aims of the thesis. The overall research program aims to examine the types of PAL that are acceptable to students and clinical educators and the effect on learning. The research will investigate same-level peers (as opposed to near peers, or students from different year levels) specifically in the clinical placement setting, an area with little high level evidence. It will include the development of a PAL model of education through stakeholder engagement (study 1); the first randomised controlled trial of PAL in the clinical setting (study 2), the first study where specific peer learning activities undertaken by students in the clinical setting are recorded and analysed (studies 2 and 3) and the first study utilising a broad range of allied health professions (study 3).

The findings may inform education providers on the placement models and PAL activities facilitated within health professional programs. The project also aims to document a set of learning objectives for clinical educators to aid them in preparing for paired placements where PAL is a central feature of the model. Engagement in a PAL model may facilitate targeted learner skills needed to work within the complex healthcare setting, such as collaborative practice, teaching and communication. Increasing the confidence of clinical educators to supervise multiple students has the potential to positively influence clinical placement capacity, which may assist with projected workforce shortages.

This program of research aims to:

- Develop and test a PAL model of clinical education for paired, professional-entry level health professional students;
- Develop and test a training module for clinical educators to increase their confidence in supervising pairs of students and facilitating PAL;
- Examine the experiences of students and educators participating in paired student placements using peer assisted learning.

The interventional studies will be completed utilising pairs of entry-level, health professional students who are on clinical placement and at the same point in the course of their study. Studies 1 and 2 will be completed in the discipline of Physiotherapy. Study 3 will apply the learning from Physiotherapy into other allied health professions, including Dietetics, Exercise Physiology, Music Therapy, Occupational Therapy, Podiatry, Social Work and Speech Pathology. A systematic literature review will be undertaken simultaneously to the study program, allowing for interplay between the processes of data collection, analysis, literature review and researcher reflection (Patton, 1990). Finally, the results of the research program will be synthesised and combined with relevant pedagogy to develop recommendations for implementing PAL models in the clinical setting.

1.4 An overview of following chapters

Chapter two will outline the methodology and methods. The project design will then be discussed, including the development of the data collection tools, surveys and focus group questions. A description of predominant analysis methods will be outlined to prepare the reader for the results chapters, which are ordered according to the study phases.

As this is a thesis by publication, chapters 3-6 contain the results of the research program, containing one publication each. These chapters collate the results arising from each study method, with successive chapters building upon the results of the previous chapters in an iterative fashion to build the picture for how PAL may be applied in the clinical environment.

Chapters 7 and 8 then draw together the work from the previous results chapters, also containing one publication each, to develop overarching recommendations for the implementation of PAL in clinical education and to challenge the preconceptions reported by clinical educators.

Chapter 9 is the final chapter of the thesis and summarises the work. It includes the strengths and limitations of the research program, suggests future areas for investigation, and makes a final conclusion regarding the place of PAL in allied health professional clinical education.

Chapter 2: Methods

2.1 An overview of research studies

This chapter summarises the methodology for the research program in this thesis. Further detail, relating to each study, is contained within the methods section of each chapter. The research program incorporated a mixed method approach, involving the collection and analysis of both qualitative and quantitative data in response to the research questions (Creswell, 2014). The studies were conducted in hospital and community settings and participants included both clinical educators and students, to address the research questions.

2.2 Rationale for research design

The context of this program of research is important to acknowledge. Context in health professional education has been described as “difficult, challenging and often messy” (Bates and Ellaway, 2016). This research was planned and conducted within the busy clinical placement environment. The research is underpinned by educational theory but is predominantly practical in nature. Participants in the research were clinical educators undertaking their usual clinical and teaching tasks and students undertaking their core clinical placements. Participation in the program of research was offered in addition to the already complex and challenging load of working and learning in the busy clinical setting. The research was therefore planned pragmatically and was an iterative process, in an effort to optimise the likelihood of successful completion and to be responsive to stakeholder feedback and results from the previous phase/s (Creswell, 2014). The research team attempted to find a balance between the theoretical and the practical throughout the studies undertaken.

Social learning theory (Bandura, 1971) informed the framing of PAL within the research program, as a specific educational intervention based on interaction between learners. This is in contrast to PAL being framed as a by-product of co-location of learners in studies focussed on comparing student to educator ratios or alternate allocation models. Learning through interaction was encouraged through the PAL activities, along with peer observation of practice, both key components of social learning theory. Social learning perspectives also acknowledge that learning is situated or context-dependent. Social, cultural and physical factors (Kilminster, 2009), were taken into account as likely influences on learning in the clinical environment. The notion of learning through immersion or experience (Kolb, 2015) is one of the cornerstone theories informing clinical education. The key components of Kolb’s learning cycle: experience, observation, reflection and experimentation were incorporated within the PAL activities included in the final model. Lave and Wenger’s (1991)

concept of the community of practice informed data analysis as the establishment of a shared domain (learning through work) was promoted through the practice of peer assisted learning. 'Legitimate peripheral participation' was encouraged in the PAL model through the development of tools that encouraged active engagement, and movement towards expertise.

Clinical educators in the allied health professions are clinicians who undertake student teaching within their usual clinical role. They are predominantly trained in a scientific or 'positivist' manner (Nestel and Bearman, 2015) where quantitative designs, statistical analyses and randomised controlled trials are privileged. It was seen as important to include quantitative methods and an experimental project design, for the program of work to be acceptable to this important stakeholder group. To examine the *experience* of PAL from the perspective of the clinical educator and student, qualitative approaches were best suited. This data was important not only to address the research aims, but also to be responsive to stakeholder feedback, to allow the opportunity for unexpected consequences to be aired and to understand the potential for longer term effects and sustainability of PAL in this setting beyond the life of the project. Therefore, a mixed method design (Creswell, 2014) was planned to address the research questions.

Experimental quantitative approaches are uncommon in the field of allied health clinical education, most probably due to the challenges of implementing such approaches in this complex setting. Engagement of key stakeholders was a central theme of the research program, and critical to its execution. Through this participatory approach (Cargo et al., 2008), multiple stakeholders who would be involved in implementation were brought together to consult on a feasible and acceptable project design and data collection methods and establish a shared vision for success (Fisher, 2005; Kotter, 1995). This stakeholder consultation and project design formed the first study of the research program (see [Chapter 3](#) for more details).

Rather than compare a paired student placement with the 1:1 (student: educator) approach (as had been done previously), this research aimed to focus on the effect of PAL *within* the paired placement. To satisfy ethical requirements and to ensure a robust strategy, it was necessary to expose each student pair to both the "PAL model" (designed in study one) and a 'control'. The research team labelled the 'control' placement the 'traditional' approach, where PAL was not actively facilitated, but students remained in pairs. To minimise confounding factors, the student pairs remained the same for both placement types. To account for the effect of time and experience within placement it was important that the order in which students undertook each placement type

was accounted for. This led us to the cross-over design, with randomisation enabled by the random allocation of student pairs to a starting position. This trial formed study two of the research program. See [Chapter 4](#) for more details and figures demonstrating the study design.

In study three the research focussed on the effect of the educator training associated with implementing the PAL model. Using an experimental design was still a priority, but based on feedback from the previous studies it was unlikely that clinical educators would participate in the project and contribute their time to data collection if we could not offer them exposure to the training (i.e. remain in a purely 'control' group). This led us to the stepped wedge design (Brown and Lilford, 2006), where all participants could be exposed to the intervention but at different time points to ensure we also had a "control" group. Unfortunately we were unable to randomise the time of intervention, as allocation to the educator training had to be performed pragmatically based on logistical considerations to ensure participants could attend. See [Chapter 6](#) for more details and figures demonstrating the study design.

2.2.1 Researcher reflexivity

Reflexivity is a process of reflection and self-searching to examine the researcher's 'conceptual baggage' (Hsiung, 2010). 'Conceptual baggage' is "a process by which you state your personal assumptions about the topic and the research process" (Kirby and McKenna, 1989, pg. 32). There are many and varied personal and professional experiences which have shaped the development of this program of research. I have always had an interest in education and have experienced a variety of learning approaches throughout my own education, from large lecture theatres in university, classrooms in primary and secondary school, smaller tutorial groups in clinical preparation, workplace learning on clinical placement and individual tuition for musical instruments. I have a strong memory of enjoying learning through interaction and this preference is likely to have influenced my alignment with social learning theory.

My experience of clinical placements occurred in the late 1990's. During this time the predominant clinical education model utilised was the 1:1 student : clinical educator model and PAL was not intentionally facilitated in my experience. When I was part of a group of multiple students allocated to a larger health service, I can recall a definite feeling of relief; we were able to organise to commute together to placement, have lunch together and arrange opportunities to debrief and brainstorm. In contrast to this, I can recall a distinct feeling of anxiety and isolation when attending placements alone. I had similar experiences as a new graduate when in rotations alone in a particular clinical area compared to being paired with a fellow inexperienced physiotherapist. These

experiences certainly influenced my own preference to supervise students in pairs when I took on the role of clinical educator.

In my roles as clinical educator and then clinical education co-ordinator I experienced and observed many different student pairs and developed an interest in understanding more about this approach. My own experience supervising pairs was extremely positive, but as a clinical education co-ordinator I supervised other clinical educators who had very different attitudes ranging from simply refusing to ever supervise more than one student, to some interest but wanting further training and support, through to always wanting to supervise students in pairs. Some clinical educators had tried supervising pairs but found it so stressful that they refused to try again. This difference in experience of the same placement model by different supervisors intrigued me. Through reading published research, listening to feedback from students and clinical educators, and further observation I began to understand that the occurrence of PAL within the paired placement had potential to influence outcomes.

As I began to experience variability in PAL experiences, my interest in researching PAL increased. The notion of trying to understand PAL as an educational strategy that can be utilised within a clinical placement, became a focus. This led to the development of the research program examining alternate types of paired placement models and the role of PAL within them. My role as a clinical education co-ordinator within the health service (rather than a University academic) positioned me strongly as an advocate for both clinical educators and students which influenced the choice of approach and outcome measures. As a health service employee it was important to include the perspectives of not only the learner but also the educator and service delivery within the organisation. It also enabled the participatory approach which features as a key tenet of the three studies.

Finally, my experiences as learner and teacher, my observations of other clinical educators and my role within the health service also influenced the alignment of the research with experiential learning theory. It seemed the obvious choice given the research program was planned to take place in the clinical placement environment, where learning is understood to occur through experience.. However, experiential learning theory proposes more than just 'learning by doing': Kolb's (1984) learning cycle and models extending the notion (Jarvis, 1995), also position observations, reflections and planning as key components for enhancing future learning encounters. In my experience this is a source of tension in health professions clinical education. Clinical placements can be seen by students and educators as an environment to 'get your hands on' where the 'doing' component of experiential learning is privileged. Using a paired placement model may threaten students' access to

'hands on' experiences (dependent on patient availability) and utilising PAL to enhance tasks such as reflection may not be seen as valuable at the outset. Participation in authentic clinical activities is an important component in Billett's (2016) workplace learning theory and aligns with Lave and Wengers (1991) 'legitimate peripheral participation' in communities of practice. Therefore the alignment with these theories influenced not only the design of activities within the PAL model (promoting observations, engagement, reflections and planning) but the research design itself (including the research questions, and the literature drawn upon to interpret the findings).

2.3 Research timeline

Study one (PAL model development) took place in July 2011. The clinical educator forums held served a dual purpose, used both to develop the PAL model through stakeholder engagement, and prepare clinical educators for participation in the research program. The paper arising from this study was written in 2012 and published in 2013.

Study two (Physiotherapy randomised controlled trial) occurred August-October 2011 during the third year Physiotherapy student placement blocks. Data collection was complete by December 2011 and was analysed during 2012. Two papers arose from this study. One, focussing on the quantitative and survey data, was written in 2013 and published in 2014. The second, focussing on the focus group data, was written in 2014 and published in 2015.

Study three (multidisciplinary controlled trial) followed in April-October 2013. Data collection was complete by December 2013 and was analysed during the first half of 2014. The paper arising from this study was written in the second half of 2014 and submitted for publication in early 2015 (currently under review by Focus on Health Professional Education).

The final phase of the research program involved the culmination of results from the systematic review (in press, Journal of Allied Health) and all three studies into recommendations for implementation, and a paper which challenges the previously held assumptions of clinical educators. This work was conducted during late 2015 and early 2016. The implementations paper was published in September 2016 and the assumptions paper is currently under review by Advances in Health Sciences Education.

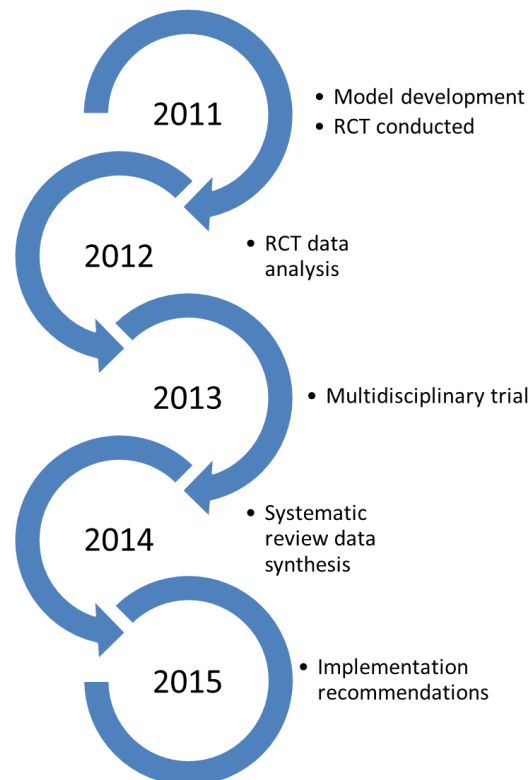


Figure 2. 1 Research timeline

2.4 Ethics

Ethics approval was granted by the health service (Monash Health Human Research Ethics Committee) and education provider (Monash University Human Research Ethics Committee) for phases 2 (11033B) and 3 (13073B). Low risk quality assurance approval was granted by the health service for phase 1. Informed consent was gathered from all participants. See [Appendix A](#) for further information.

2.5 Setting

This program of research was conducted within Monash Health, a large tertiary health service network in Victoria, Australia. The health network includes six distinct hospital campuses, and multiple mental health, community health and community rehabilitation centres. The network has a dedicated collaboration with a number of education providers in preparing students for professional practice. Within the network, clinical educators (clinicians with student education responsibilities as part of their usual workload) provide education to students enrolled in programs preparing them for entry to the profession on graduation.

Whilst the decision to conduct the research within the one health service was largely pragmatic, it is important to acknowledge the implications. Ongoing stakeholder engagement was a critical component of this project and therefore not logistically possible to conduct on a larger scale in multiple health services without significant resources. Utilising one health service does limit the generalisability of the findings, however the multisite nature and range of settings utilised within the health service (acute hospital, rehabilitation, mental health and community centres) was a strength in this respect. Similarly, utilising one allied health profession (physiotherapy) in study two limits the generalisability of the findings, but utilising a range of allied health professions in study three was a strength in this respect.

2.6 Participants

To address the research aims, participants included both clinical educators (allied health clinicians with student supervision responsibilities as part of their clinical role) and students (students completing a clinical placement as part of an entry-level allied health professional program). Clinical educators were invited to participate if they had no previous formal education in PAL, were available to supervise student pairs during the study period and were able to attend the relevant PAL workshops. Students were invited to participate if they were being supervised in a pair on clinical placement by eligible clinical educators enrolled in the study.

2.6.1 Recruitment and participant flow through studies

In the PAL model development phase, a scoping exercise was undertaken with physiotherapy clinical educators to engage them as stakeholders in the process of developing a suitable model of PAL, and ascertain interest in participation. When interested stakeholders were identified, four two-hour workshops were arranged at monthly intervals. A range of participants attended each workshop (12-17). Some, but not all, of these participants continued on to participate in the randomised controlled trial (RCT).

Participants in the RCT were clinical educators and students from the physiotherapy profession. All physiotherapy clinical educators at the health service were invited to participate. Students were invited to participate if they were being supervised by a recruited clinical educator. None of these participants continued on to participate in the multi-disciplinary trial due to the exclusion criteria (participants were required not to have attended any formal training in PAL prior to the multidisciplinary trial and formal training was a component of the RCT).

Participants in the multidisciplinary trial were allied health professional clinical educators and students from the disciplines of dietetics, exercise physiology, music therapy, occupational therapy, physiotherapy, podiatry, social work and speech pathology. All allied health clinical educators at the health service were invited to participate. Students were invited to participate if they were being supervised by a recruited clinical educator.

2.6.2 Inclusion and exclusion criteria

Clinical educators were invited to participate if they had no previous formal training in facilitating PAL and were available to attend the relevant workshops. Students were invited to participate if they were attending a clinical placement in a pair and being supervised by a recruited clinical educator.

2.7 Outcome measures

A range of outcome measures were used throughout the research program and are detailed in the relevant chapters. Data collection tools were developed prospectively in consultation with stakeholders where outcome measures could not be found in the published literature. These tools (namely the student activity record and the clinical educator workload recording sheet) were developed in response to stakeholder feedback that these elements were a priority to capture to understand the effect and experience of PAL in the clinical setting. Data collection templates used can be found in [Appendix C](#), surveys used can be found in [Appendix D](#) and focus group schedules and discussion prompts can be found in [Appendix E](#).

2.7.1 Student activity record

The 'student activity record' was designed by clinical educator participants during the model development phase. Participants discussed and debated a range of clinical education activities that would be documented in an effort to encompass most student activity in a day on clinical placement. Both the research team and participants agreed that it was important for the tool to be easy to use to minimise the impost on students and maximise the potential for full data collection. For this reason the consensus from participants was that students would record activities in terms of the number of occurrences (frequency) as opposed to the time spent in each activity. The tool was kept to one page view, with a full week of placement being represented on a single page.

The student activity record was developed by physiotherapy clinical educators and used by physiotherapy students in the RCT. Before applying it in the multidisciplinary trial, a range of allied health clinical educators were consulted to ensure its applicability in other professions. No changes

were required on this basis, however the items specific to the PAL model trialled in the RCT were removed from the student activity record use in trial 3.

2.7.2 Clinical educator workload statistics

The clinical educator workload statistics recording sheet was designed by clinical educator participants during the model development phase. It was the decision of the participants that the existing workload statistics collected by the health service (via an electronic database) did not encompass the entire picture of clinical educator workload and that a separate data collection sheet was required. Participants discussed and debated a range of activities that would be documented in an effort to represent the activities they perceived to be affected by supervising students in the workplace. Clinical educators agreed to record their workload activities in minutes per activity per day.

2.7.3 Surveys and focus groups

It was not feasible for all students and clinical educators to participate in focus groups on multiple occasions throughout the research program due to time constraints. Therefore in order to collect data from students and clinical educators on the perceived effect and experience of PAL while it was occurring, online surveys were used. The surveys included a combination of Likert scale responses to statements and free text responses to open questions. Survey items were drawn from the literature, including perceived anxiety, workload, satisfaction, usefulness of specific PAL activities, benefits and drawbacks.

The surveys were drafted by the lead investigator and reviewed by the wider research team (inclusive of clinical educators from the health service). These were then expanded on by the research team, and the wording of questions was refined to reduce ambiguity in meaning. The surveys were uploaded onto SurveyMonkey (electronic survey platform) and links were emailed to participants at the relevant steps of each trial. The clinical educator survey links were emailed directly to participants by the lead investigator. The student survey links were emailed to student participants via the clinical placement coordinators.

2.8 Reliability and validity of measurement tools used in the research program

2.8.1 Reliability and validity of the primary outcome measure

The primary outcome measure used in the RCT (study 2) was student performance rated on the Assessment of Physiotherapy Practice (APP). The APP instrument is designed to monitor longitudinal evaluation of physiotherapy student performance in the clinical environment and has been shown to be reliable (intraclass correlation coefficient [ICC] (2,1) = 0.92, 95% confidence interval [CI] 0.84–0.96) (Dalton et al. 2012) and has been validated against a range of other indicators (for example stability in hierarchy of item difficulty, global rating scores) (Dalton et al. 2011). The APP is comprised of 20 items in seven key areas that map to the core competencies specified in the Australian Standards for Physiotherapy (APC, 2006). Each item is rated from 0 to 4, giving a total score ranging from 0 to 80, with a higher score representing better performance. The standard error of measurement for the APP is low and the minimal detectable change at 90% confidence was 7.9 (Dalton et al. 2011). Further information on this outcome measure can be found in [chapter 4](#).

2.8.2 Qualitative data credibility and trustworthiness

Clinical educators who were not part of the research team distributed survey links to student participants and survey data was collected anonymously. Health professionals independent of the research team were employed to facilitate focus groups. Transcription of the audiotaped focus group discussions was conducted independently of the research team.

All qualitative data was coded independently by the lead researcher and at least one other member of the research team. An extended analysis framework was developed cooperatively based on these triangulated codes, cross-checked against transcripts, circulated to all researchers, discussed, and adjusted to reflect key themes in the data. Disagreements were negotiated through consensus, thus adding rigour to the analysis process (Bearman and Dawson, 2013). The results were reported back to participants for further validation.

Triangulation of qualitative data was employed to strengthen the results. Triangulation of source was achieved by collecting data on both the student and clinical educator experience via focus groups and including codes from both sources in the extended analysis framework. Triangulation of methods was employed by collecting qualitative data through both surveys and focus groups and including codes from both sources in the extended analysis framework.

2.9 Data collection and management

Quantitative data was collected in paper form and stored in a locked filing cabinet in the locked office of the lead investigator. Electronic data (data entered for analysis, audiotaped recordings and transcriptions) were saved on a password protected drive. Data was collected and managed in accordance with ethical requirements.

2.10 Data Analyses

Specific details regarding the statistical analyses used in each study can be found in the relevant chapters. The following information provides an overview and justification for the use of certain approaches within the program design.

2.10.1 Quantitative data analyses

Quantitative analyses were chosen based on the question and data type, and the reasons for interrogating the data. Quantitative data from the survey was collated in Microsoft Excel, which was used for basic calculations and graphs. STATA (IC) 13.0 was used for statistical analyses. Linear regression was used to analyse the student performance measure, the reported student activity and the clinical educator workload statistics. A Wilcoxon signed-rank test was used to analyse Likert scale responses on pre- and post-intervention surveys (studies 1 and 2). Ordered logistic regression was used to analyse Likert scale responses in the stepped wedge design (study 3).

2.10.2 Qualitative data analyses

Thematic Analysis (Miles et al., 2014) was the primary analytical method used for qualitative data in accordance with the research questions and aims. Thematic analysis emphasizes identifying, scrutinizing, and recording patterns (or "themes") within data. Themes then become the units for analysis which is performed through the process of coding in six phases to create established, meaningful patterns. These phases are: familiarization with data, generating initial codes, searching for themes among codes, reviewing themes, defining and naming themes, and producing the final analysis.

Thematic analysis was chosen as the qualitative analysis approach because it allows flexibility, in that multiple theories can be applied to this process across a variety of epistemologies. Thematic analysis also allows researchers to expand the range of study past individual experiences. It is well suited to multiple researchers and large data sets as was the case in this research program.

2.11 Summary of research methods

This research program incorporated a mixed method approach and two novel experimental study designs. A range of both qualitative and quantitative data were collected in response to the research questions. A number of outcome measures and data collection methods were used and efforts were made to maximise reliability and trustworthiness through the research design wherever possible. The research program was planned pragmatically and was conducted in hospital and community settings with clinical educator and student participants. The key underpinning theoretical educational frameworks were social and experiential learning theories.

Chapter 3: The development of a peer assisted learning model of clinical education for entry-level physiotherapy students

Preface

Chapter 3 describes study 1, which was the stakeholder engagement phase where participants were involved in both the design of the PAL model and the methods for testing the model in study 2. This chapter is adapted from a published article by Sevenhuysen SL, Nickson W, Farlie MK, Raitman L, Keating JL, Molloy E, Skinner E, Maloney S and Haines TP. (2013). The development of a peer assisted learning model for the clinical education of physiotherapy students. *Journal of Peer Learning*, 6(1).

3.1 Introduction

It is widely recognised in the health professions that learning in the authentic practice environment is valued by students, clinicians and academics for developing skills and attributes for professional practice (Ernstzen et al. 2009, Ryan et al. 1996, Speech Pathology Association 2005, World Confederation of Physical Therapy 2011). With health professional student numbers increasing world-wide, appropriate clinical education is increasingly difficult to source and provide (Rodger et al. 2008). Universities and health services might benefit from a 'multiple student to clinical educator' model if this could be achieved without compromising placement quality. However, there is little high-level evidence supporting effective and acceptable methods of clinical education when clinical educators have concurrent responsibility for more than one student in the workplace.

In the allied health professions, students must be work ready at the point of graduation. Allied health practitioners deliver interventions that carry risk of harm e.g. encouraging mobility of a painful joint carries the risk of symptom aggravation; rehabilitating mobility carries the risk that the patient might fall; manual handling techniques must be adjusted to minimise risk of harm to both the practitioner and patient. Perhaps because of these risks and responsibilities in care delivery, educators tend to supervise students intensely and often in a one to one educator to student ratio. Clinicians report that multiple students are burdensome, a notion which has been supported by a study of physiotherapy students (n=36) and clinical educators (n=31) that reported the clinician satisfaction and overall facility productivity gains (as measured by a combination of the mean clinical educator patient care time, mean clinical educator time spent in other activities, and mean student direct patient care time) were greater in a 1:1 model than a 2:1 model when compared with the no-student baseline (Ladyshevsky et al. 1998). To address barriers of this nature, the design of any model of clinical education should be endorsed by both student and clinical educator, and maintain or improve educational and clinical performance outcomes relative to alternative models.

Students of physiotherapy and other health professions are challenged by clinical education (Laitinen-Vaananen et al. 2007) and report feeling under-prepared for the demands of the practice environment (Katinka et al. 2005). Peer assisted learning may enhance the learning opportunities for students by adding peer feedback to that provided by the clinical educator, providing opportunities for explicit discussion of decision making processes, enabling sharing of challenges to 'normalise' the perception of difficulty in adjusting to learning in a challenging environment and adding 'social' support (Secomb 2008, Skøien et al. 2009). In addition to the potential for increasing student satisfaction with clinical education, PAL has the potential to increase capacity for workplace education by creating a framework for education of students in a 'multiple student to educator' ratio.

Empirical evidence of effects of various 'multiple student to educator' models on student, educator and patient outcomes is limited (Lekkas et al. 2007, Moore et al. 2003, Roberts et al. 2009, Strohschein et al. 2002). Qualitative investigations into physiotherapy education have concluded that the company of another student on placement reduces student anxiety and aids learning (Baldry-Currens 2003, DeClute et al. 1993, Skøien et al. 2009). However, no reports provide a structure, reproducible framework or specific tools for physiotherapy education that enable objective measurement of the effects on learning outcomes in clinical placements. A systematic review of 12 (mainly qualitative) studies of clinical education of health science students by Secomb (2008) concluded that learning outcomes were enhanced by peer teaching and learning. There was little description or evaluation of the amount or type of PAL in the included studies. The effects of peer support on learning outcomes is likely to be influenced by many factors, including how the program is actively facilitated, and prior, potentially pre-clinical, initiatives that create a context that enables peer learning (Boud, 1999).

Moving from a 1:1 student to educator model to a 2:1 model brings challenges. Educators may feel that this is shifting them away from a system in which they are relatively comfortable and into a supervisory framework within which they will have less control. Success in managing change requires stakeholder ownership, and a shared vision regarding the potential for gain in adopting change (Fisher 2005, Kotter 1995). Essential to implementation of our peer assisted learning model was identification and utilisation of facilitators to develop strategies to address barriers. In establishing this project, multiple stakeholders who would be involved in implementation were brought together to design a feasible and acceptable model. In consulting the literature on participatory research (Cargo et al. 2008), empowerment of participants was identified by researchers as essential to the success of this project.

This paper describes both the process for developing a PAL model for physiotherapy clinical education, and the elements of the model that evolved. It also describes the evaluation of the self-rated confidence of the clinical educators in facilitating peer assisted learning before and after engaging in the development process.

3.2 Method

3.2.1 Design

A scoping exercise was undertaken with physiotherapy clinical educators to engage them as stakeholders in the process of developing a suitable model of peer assisted learning, and ascertain interest in participation. When interested stakeholders were identified, four two-hour workshops were arranged at monthly intervals. The design of the workshops, and the key concepts and potential activities that could be included in the model, were developed by the research team, drawing on existing practice and health education literature. A participatory research design was utilised (Cargo et al., 2008).

The aims of the workshop series were to identify and select teaching and learning activities to facilitate peer assisted learning and to determine the number of activities that would be feasible and acceptable in a typical week of student placement. It was hoped that this collaborative process would improve participants' confidence as facilitators of peer assisted learning. Participants were recruited from a range of areas of practice and service delivery settings, and with varying levels of experience, to optimise the feasibility and applicability of the final model. Audiotaped participant discussion in the workshops, participant written feedback and facilitator reflective debrief forms, were reviewed by the research team after each workshop. This enabled development of suitable objectives for subsequent workshops and tailoring of workshop methods.

3.2.2 Participants & Setting

All physiotherapists working in a large health service network in Victoria, Australia who provided clinical education as part of usual duties were eligible for inclusion ($n \approx 30$). Clinicians provided education to physiotherapy students enrolled in programs that prepared them for entry to the profession on graduation. The health network included five distinct hospital campuses, and community health and rehabilitation centres. The network has a dedicated collaboration with a local university in preparing students for professional practice. Across the network, approximately 70 physiotherapy students take in excess of 3,000 placement days annually.

3.2.3 Measurement instruments

A participant workshop satisfaction survey was used to enable participants to comment on what they liked about each workshop and areas that could be improved. They also rated the 'usefulness' of each workshop on a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, see figure 1) and could provide free text feedback. Participants self-rated their perceived ability to facilitate peer assisted learning on a pre- and post-workshop survey (table 5).

At the end of each workshop, facilitators and observers individually completed a debrief form to capture reflection on the main issues or themes that arose, information gained, questions emerging, concerns, problems or challenges, general atmosphere and group dynamics. Each workshop was audio-taped and reviewed to consider responsive strategies for subsequent workshops.

3.2.4 Procedure

The Southern Health and Monash University Human Research Ethics Committees approved the study. Permission was sought from the physiotherapy managers to seek volunteers from their staff for the project. In September 2010, the project's principal investigator provided information regarding the project to clinical education coordinators and key contacts at the network hospitals in a face-to-face meeting. The key contacts were senior physiotherapists who held a team leader role within a clinical area or a student education portfolio at a particular site. Subsequently, all clinical educators from each of the five sites were provided with information regarding the project via email and invited to participate. Participants signed informed consent prior to study commencement.

Participants were asked to complete an anonymous survey of their self-rated confidence to facilitate peer assisted learning prior to commencement of the first workshop. In workshops, participants contributed ideas and discussed experiences. They identified areas where they wanted additional information, expressed concerns and uncertainties about implementation, and discussed solutions to potential issues in refining and developing a model. Attempts were made to limit passive participation during the workshops by providing participants with pre-reading and incorporating practical activities into the workshops.

Participants reviewed teaching and learning tools and activities from published literature and current practice that could be used to facilitate peer assisted learning. The tools/activities presented for discussion were:

- A peer feedback book

- Where performance-based comments by the student peer are entered e.g. to note that a particular behaviour is observed.
- An educator feedback book
 - Where performance-based comments by the clinical educator are entered e.g. when a particular behaviour is observed.
- Peer observation and feedback
 - A template was designed by the research team to encourage the student peer to provide feedback in line with assessment targets of the Assessment of Physiotherapy Practice Instrument (Dalton et al., 2011). The template would guide student peer feedback after observing patient assessment and/or intervention and incorporated methods recommended in the Pendleton model (Pendleton et al, 1984).
- A verbal feedback triad
 - A three-way conversation between a clinical educator and student peers about an interaction between a patient and student, observed by peer and clinical educator.
- The 'Summarise, Narrow, Analyse, Probe, Plan, Select' (SNAPPS) method (Walpaw et al., 2003)
 - A tool adapted by the investigators to guide students in presenting case information to a clinical educator. In the peer assisted learning model this tool was completed by the pair of students in collaboration.
- The complexity-risk matrix (Kneebone et al., 2007)
 - A tool adapted by the investigators to guide students to map complexity and risk in clinical situations. In the peer assisted learning model this tool was completed by the pair of students in collaboration.
- The reflective practice template
 - A tool designed by the principal investigator to guide critical reflection on a patient interaction or experience
- The 'Introduction, Situation, Background, Assessment, Recommendation' (ISBAR) method (Marshall et al., 2009)
 - A tool designed to improve the quality of information exchange between health professionals e.g. in a handover situation
- The Advanced Trauma Life Support (ATLS) five step teaching method (George et al., 2001)
 - A five-step method for teaching psychomotor skills

The strengths and weaknesses of the tools and activities for use across different settings were actively debated. Elements were ruled in or out of the planned model based on unanimous agreement between clinical educators. When the tools and activities to be utilised were finalised, participants were asked to develop consensus on the minimum frequency of application or use of the identified elements.

Each workshop had two facilitators, and one or two observers. Participants completed the anonymous post-workshop survey of self-rated confidence to facilitate PAL after workshop IV.

3.2.5 Analysis

Workshop attendance and participant demographics are presented in table 1 & figure 1. Audio recordings of workshop discussions were transcribed verbatim on completion of the fourth workshop. Two members of the research team independently coded the transcripts using thematic analysis (Miles et al., 2002); themes were determined by common identifications. Likert scale responses to the pre- and post-workshop survey items were analysed using a two-sample Wilcoxon rank-sum Mann-Whitney U test.

3.3 Results

3.3.1 Demographics

Workshops were open for any physiotherapy clinical educators to attend, and attendance at all four workshops was not compulsory. Therefore, a range of participants attended each workshop (12-17, see figure 3.1). Attendance was recorded in a de-identified manner so a total number of participants across the four workshops was not able to be calculated (many participants attended multiple workshops). Fourteen participants chose to provide their demographics via an online survey and the results are presented in table 3.1. The majority were aged 25-30 years and most had less than three years' experience as a clinical educator (table 3.1).

Demographic	Range	n	%
Age	20-25	4	29%
	25-30	8	57%
	30-35	1	7%
	35-40	0	0%
	40-45	1	7%
	Total	14	100%
Years of experience in clinical practice	< 1	0	0%
	1-3	5	36%
	3-5	5	36%
	5-10	3	21%
	> 10	1	7%
	Total	14	100%
Years of experience in clinical education	< 1	3	22%
	1-3	7	50%
	3-5	2	14%
	5-10	2	14%
	> 10	0	0%
	Total	14	100%
Confidence in clinical education	Not confident	0	0%
	Neutral	6	42%
	Somewhat confident	4	29%
	Confident	3	22%
	Very confident	1	7%
	Total	14	100%
Number of workshops attended	0	0	0%
	1	8	58%
	2	2	14%
	3	2	14%
	4	2	14%
	Total	14	100%

Table 3. 1 Clinical educator demographics

3.3.2 Satisfaction

The 'usefulness' of the workshop material was rated highly, and ratings appeared to improve after the first workshop (figure 3.1).

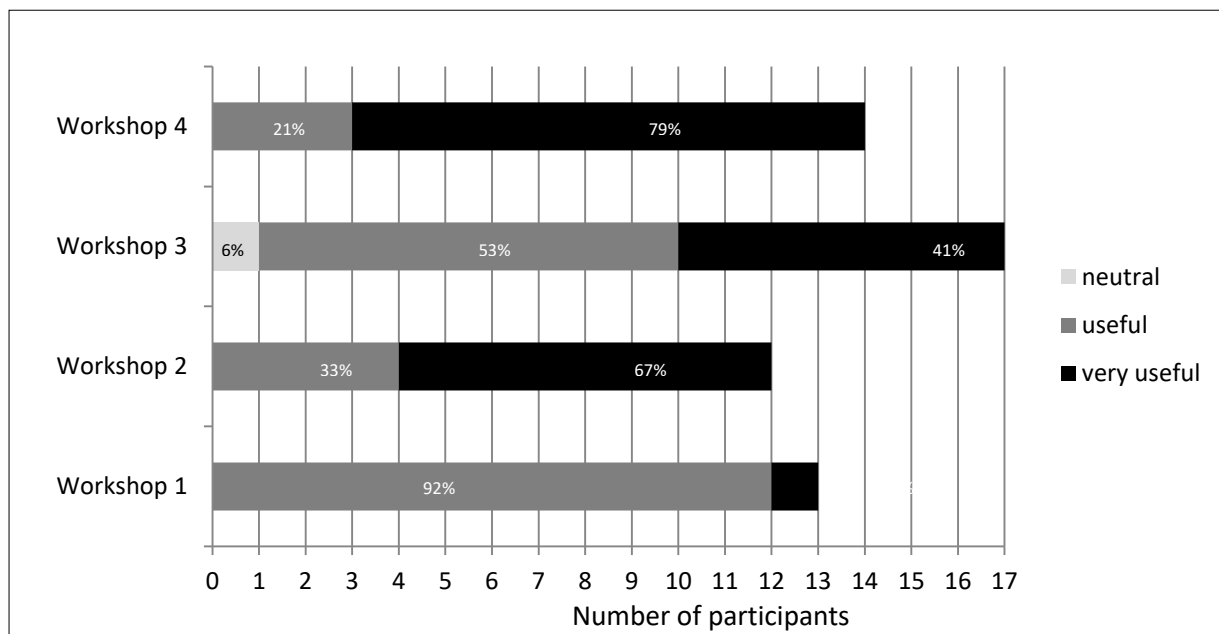


Figure 3. 1 Clinical educator workshop attendance and 'usefulness' rating

3.3.3 Workshop content

The objectives of workshops II, III and IV were revised prior to each workshop, based on the feedback from the previous workshop (table 3.2). It became evident that participant priorities were driven by interest in model content, and how it would impact on their work practices. Peer assisted learning (educator to educator) was deliberately employed as a strategy for engaging participants in workshops, as clinical educators were encouraged to learn from one another's experience and ideas. Table 3.2 shows the workshop modifications that evolved through participant feedback and observation of workshop dynamics.

Workshop	Planned (original) workshop objectives	Revised workshop objectives (as delivered)
I	<ul style="list-style-type: none"> Define peer assisted learning Discuss advantages and disadvantages of a range of peer assisted learning strategies in clinical education Identify potential barriers to cooperative learning in clinical education Discuss principles of effective 'active' observation of clinical performance and how they would be taught to students Demonstrate principles of effective peer feedback and discuss how they would be taught to students 	<ul style="list-style-type: none"> Define peer assisted learning Discuss advantages and disadvantages of a range of peer assisted learning strategies in clinical education Identify potential barriers to cooperative learning in clinical education Identify key facilitators to effective peer assisted learning
II	<ul style="list-style-type: none"> Demonstrate Advanced Trauma Life Support (ATLS) technique as it would be taught to peer learners Demonstrate and teach models designed to evaluate clinical communication as it would be taught to peer learners Demonstrate and teach the use of a reflective practice tool, as they would teach it to students in a peer assisted learning context 	<ul style="list-style-type: none"> Identify domains of clinical practice that could be developed in a peer assisted learning model of undergraduate physiotherapy education Identify clinical teaching activities that could be used in each domain Identify clinical education tools that could be used to structure the peer assisted learning model Explain the application of the Feedback Book as a tool to use in the peer assisted learning model
III	<ul style="list-style-type: none"> Identify key determinants of clinical reasoning in novice practitioners Demonstrate and teach models used for the presentation of clinical case information and clinical reasoning as it would be taught to peer learners to structure their case presentations Teach the concept of risk management in clinical practice using a risk management tool, as they would teach it to students in a peer assisted learning context 	<ul style="list-style-type: none"> Review two SNAPPS tools completed by a students to decide how the tool could be used in a peer assisted learning context Perform a risk assessment using the complexity-risk matrix to identify degrees of risk and complexity in clinical practice and relevance to clinical education Discuss how tools will be applied (frequency, instructions etc.) in the peer assisted learning model
IV	<ul style="list-style-type: none"> Design a placement timetable that incorporates use of peer assisted learning strategies Identify strategies that can be used in the event of educator or student absence in a placement incorporating peer assisted learning strategies Identify items and learning objectives on the Assessment of Physiotherapy Practice (APP) that are related to performance in peer assisted learning activities 	<ul style="list-style-type: none"> Explain the components of the peer assisted learning model and list the minimum requirements Understand the intended use of the tools in the peer assisted learning model and how to introduce these to students Explain the data collection requirements of the supervisor and student in the peer assisted learning and traditional 2:1 models Identify the features of a sub-optimal peer relationship Discuss approaches to management of sub-optimal peer relationships

Table 3. 2 Original and revised clinical educator workshop objectives

3.3.4 The peer assisted learning model

The PAL model developed during the workshop series is presented in table 3.3. The model incorporates practices and frameworks that clinical educators considered to be important, realistic and applicable in practice. Clinical educators in the workshops stressed the importance of maintaining or improving student outcomes, while reducing the burden of direct student supervision on their workload. Clinical educators selected the tools and activities based on the following criteria that they identified as important:

- Suited student pairs (rather than single students)
- Easy for students to use
- Did not rely on intensive input from the clinical educator
- Provided meaningful learning experiences for the students
- Applicable across work areas and health care settings

These criteria led to the modification of a number of the tools and processes, including the development of checklists and standardised instructions to aid clinical educators and students implementing the model in the clinical environment. Workshop participants raised concerns that written feedback from clinical educator to student could be seen by the students peer if a common feedback book was used. Consequently separate educator/student and student/student feedback books were agreed on. Participants also identified “ground rules” for acceptable content of verbal feedback triads; personal and professional behaviour issues were to be addressed on a one to one basis. Participants set targets of facilitating peer interaction across the key areas of i) feedback ii) clinical reasoning and iii) risk identification. This would be achieved by students completing the chosen tasks or activities in pairs, at a time and frequency (table 3.3) that was determined by unanimous agreement between clinical educators over the course of the four workshops.

	Feedback				Clinical Reasoning	Risk identification
TOOL/ACTIVITY	Peer Feedback Book	Educator Feedback Book	Peer Observation Form	Verbal Feedback Triad	SNAPPS	Complexity-Risk Matrix
MINIMUM FREQUENCY	2 per student per week	2 per student per week	2 per student per week	1 per pair per week	3 per pair per week	2 per pair per placement (5 weeks)

Table 3. 3 The peer assisted learning model

3.3.5 Thematic Analysis of Workshop Transcripts

Three themes emerged from analysis of the workshop transcripts: concerns about 'process and logistics', 'student outcomes' and 'clinical educator outcomes'. Themes evolved from uncertainty surrounding the processes, logistics and impact on clinical educators in workshop I, to strategies for optimising student and educator outcomes in workshop IV.

Workshop I revealed a large degree of uncertainty. Concerns about the process ranged from no knowledge of PAL to how it would actually work: "I feel like we need to know what peer assisted learning is first, and we need to leave the research part out of it for the moment" and "everyone can make it work in different ways but once we know the core of what's required it will be easier to extrapolate it to what we do." Other comments related to specific aspects of process, with early identification by participants of elements that would need to be standardised: "There will have to be some consistency across areas in terms of the tools" and "what do people think about setting a minimum number of PAL activities that they might want to aim for during each day in a PAL block?" Despite the uncertainty, the majority of participants were positive about participating in the project "I think it's exciting that we are collaborating as a research team and a clinical team to come up with it together" and "It is good to get everyone in the same room talking about different ways to supervise students full stop".

In workshop II participants were asked to reflect on and discuss traditional approaches to student education and how these could be utilised in a PAL model. Participants identified teaching and learning activities currently undertaken by clinical educator and student, and discussed how these could be completed by student peers "...either watching their supervisor or another student". Participants noted that these interactions could be structured to optimise student outcomes: "[the students] need to articulate what were the things that were good or bad or could be improved on in that session". Concerns were raised about how students would react to peer feedback "I don't know how the students would feel... well I don't know how comfortable they would be" and "I think it should be at the students' discretion as to what degree they want to take on board the feedback from another student".

In workshop III participants were asked to discuss and reach decisions about the tools and frameworks to be included in the final PAL model. Selection of the tools and frameworks largely centred on:

- a) maximising student outcomes by targeting peer activities that were meaningful and realistic and likely to enable learning "The reflective practice worksheet is not something

that the students would do between each other. It might be more of a private student thing so maybe it doesn't fit" and

b) maximising educator outcomes by designing tasks that were relevant to developing competence across a range of practice areas "...the SNAPPS can be useful in a lot of different ways".

In workshop IV participants were encouraged to raise concerns regarding planned peer assisted learning processes and potential impacts of the model on student and/or educator outcomes. Sub-optimal peer relationships and their effect on both student outcomes (satisfaction and learning) and educator outcomes (satisfaction and workload) were of concern to many participants: "what if you get two students who are a different mix [of skill levels] or demonstrate different knowledge?" and "they might be good friends and they have difficulty giving each other honest feedback".

Participants were encouraged to discuss strategies for management of sub-optimal peer relationships, including educator modelling of productive behaviours "you can sit them down and say if you're struggling to give feedback, here is my feedback and these are the sort of things I want you to look out for when you next give feedback".

Clinical educators (n=14) who participated in the model development sessions reported significantly more confidence ($p < 0.01$) to facilitate six out of the eight identified PAL components on completion of the workshops. In a larger sample or without the alpha adjustment required for 95% confidence, a positive change in confidence would have been concluded for all assessed elements (table 3.5).

Item	Pre Median (Q1,Q3)	Post Median (Q1,Q3)	p value (rank sum)
I think I am able to:			
Define peer assisted learning	3 (2,4)	4 (4,4)	0.002*
Incorporate peer assisted learning activities in to my teaching	3 (2,4)	4 (4,4)	0.003*
Detail the evidence of peer assisted learning to my colleagues	2 (2,3)	4 (3.25,4)	0.006*
Recognise barriers to cooperative learning	4 (3,4)	4 (4,4)	0.07
Minimise barriers to cooperative learning	2.5 (2,3)	4 (3.25,4)	0.006*
Teach principles of active observation	2 (2,3)	4 (3.25,4)	<0.001*
Use principles of effective feedback delivery	4 (3,4)	4 (4,4)	0.07
Effectively teach the use of a tool to guide reflective practise	3 (2,3)	4 (4,4)	<0.001*

Table 3. 4 Clinical educator self-rated confidence to facilitate components of peer assisted learning. Q1 – 25th centile value, Q3 – 75th centile value.

3.4 Discussion

This study advances PAL research in undergraduate physiotherapy clinical education (Baldry-Currens, 2003; DeClute et al., 1993; Skøien et al., 2009) by providing a repeatable model that unambiguously describes activities designed to facilitate PAL for use in clinical setting. It also provides a platform for setting the number of PAL activities for testing during a clinical placement, which is critical in the context of repeatability, measuring adherence to the model and model evaluation. The study also provides an exemplary model for engagement of stakeholders in education initiatives.

Clinical educator participants identified that the key driver for developing a clinically applicable PAL model was to reduce the burden of multiple student placements for clinical educators, while maintaining or improving student outcomes. This is not unexpected, given that the role of clinical educator is generally perceived by clinicians to be complex, time consuming and stressful (Higgs et al., 2007; Spencer, 2003; Baldry-Currens et al., 2000; Napthine, 1996). Previous research indicates that clinical educators perceive clinical education as time consuming and that it reduces opportunities for professional development and quality improvement projects (Sevenhuysen et al., 2011). It was therefore critical that the model was acceptable to clinicians and was not perceived as adding to their workload. Clinical educators agreed that PAL did present an opportunity to reduce educator burden and increase student autonomy. The model would include tools and activities that student peers could complete together without the direct supervision of the clinical educator.

During the workshops, clinical educators identified potential benefits for the student in utilising a structured PAL model. These included making the student experience more equitable and consistent as they move across clinical areas and increasing transparency in relation to the educational approach to clinical placements “it will organise and standardise the process”. This has not been identified in previous research, and has likely arisen due to the multi-site nature of the project and the fact that the clinical educators varied in areas of expertise and levels of experience. Student peers providing social support to one another was discussed as a potential benefit for the student and the clinical educator. For the students it could provide companionship, informal opportunities to question and reflect and reduce reliance on educators to provide information, advice, counselling and pastoral care. Benefits such as these have been reported to have occurred in previous PAL research (Baldry-Currens, 2003; DeClute et al., 1993; Skøien et al., 2009; Secomb, 2008).

Interestingly, there was little discussion about the educational advantages of utilising PAL, despite the relevant pedagogic literature being presented to clinical educators in the first workshop. This suggests that reported outcomes of PAL such as development of leadership skills, teaching, feedback and evaluative judgement skills (Secombe, 2008) were not considered a priority by the clinical educators. The tools and activities chosen by the clinical educators focussed on areas that they considered to be useful in developing 'clinical competency' e.g. risk identification, procedural skills and clinical reasoning. This provides an interesting insight into the clinical educators' decision making and what they privilege when considering student competency and clinical education, and an area for research attention.

The most frequently raised concern about the implementation of PAL, was the potential for sub-optimal peer relationships to impede learning. This concern was related to two key concepts: a) managing competition and difference (ability, learning styles, confidence levels and absence) and b) quality control. Uncertainty in managing competition and student difference is consistent with the perceptions of clinical educators reported by Baldry-Currens et al (2003). The quality control issue predominantly related to accuracy of peer feedback, but included concerns regarding the accuracy of the information or instruction that is shared between students and the effect this could have on students' learning outcomes. This finding has also been reported in previous literature (Zavadak et al., 1995) and is not surprising given that clinical educators report they feel heavily responsible for students' learning outcomes (Sevenhuysen et al., 2011).

An important finding in this project was the improvement in engagement of participants in the model development as demonstrated by a shift from simple process/logistical concerns to generation of potential solutions to consideration of complex sub-optimal peer relationships. This shift is in line with processes described in literature regarding change management (Prochaska et al, 1982) and represents the participants moving through the phases of contemplation and determination to the action phase. The increased engagement was represented in the workshop transcripts, but also confirmed by the increased attendance and 'usefulness' rating across the four workshops. It was achieved by responding to the continual critical review of stakeholder feedback and adjusting the content of the workshops and the model itself, based on this feedback. It was also achieved by allowing 'space' for participants to raise concerns and discuss potential solutions for these concerns. Workshop IV, which particularly focussed on sub-optimal peer relationships, received the highest usefulness rating.

Clinical educators who attended the workshops reported increased self-rated confidence to facilitate PAL in the clinical setting. This is essential given that health professionals frequently cite that they require more professional development and educational support (McAllister et al., 2008; Baldry-Currens et al., 2000; Cross, 1992, Strohschein et al., 2002) and more education on PAL specifically (Baldry-Currens et al., 2003). Without confidence to utilise the PAL strategies, it is highly unlikely to be implemented in an effective or sustainable way.

The model described in this paper is a pragmatic operational framework based on what clinicians were willing to accept as workable practices within a clinical setting. The project was conducted in one health service with one group of clinical educators, which limits its generalisability. Clinical educators who participated in the model development workshops were volunteers and therefore a self-selecting group. Issues may have been missed that related specifically to clinical educators who did not volunteer, for example, clinical educators who have a particularly negative view of paired student placements may have chosen not to volunteer. There was potential for survey response bias in the post-workshop survey, as participants may have built a relationship with the key investigator through the research process and, by involvement, may have had a vested interest in the result.

The analysis of this data was also limited as we employed a non-parametric approach for unmatched data even though pre and post measures were taken from the same participants. We used this approach because the data from the pre and post assessments contained no participant identifiers. We felt that it was important for participants to complete these surveys anonymously as the questions may have revealed private self-evaluations of professional competence as an educator. As matched data analysis approaches are more sensitive than unmatched, the overall picture that the self-perceived ability of participants to facilitate PAL was improved through participation in the workshops would not have changed.

Further research is required to test how the PAL model developed impacts on stakeholder outcomes. Based on the issues described in our workshops, further research should consider the effect of PAL from the perspective of the student (performance, satisfaction and the profile of the student placement e.g. number of patients seen); and the clinical educator (workload, satisfaction and confidence). There is also potential to trial the model with other professional groups via a similar participatory workshop process. Efficiencies could be gained by utilising the frameworks

learnt through this research, and consultation with stakeholder groups could identify changes/refinements to the existing model according to their specific context.

As the cohesion of peer relationships was the biggest area of concern for our participants, more research is required to determine how students can be best matched in pairs or groups to maximise learning outcomes, or whether concerns about relationship cohesion are justified. Early research in this area has identified the potential for learning styles to be utilised in pairing students (Sandmire et al., 2004).

Although it was not raised as a priority area by our participants, another area for future research is measurement of how PAL impacts students' ability to develop teaching skills and skills in evaluative judgement which are deemed key competencies for professional practice (Frank, 2005).

3.5 Conclusion

Development of a PAL model of clinical education acceptable to clinicians was achieved using a participatory approach from concept stage. The model developed has potential to increase efficiencies in clinical education by facilitating meaningful peer assisted learning activities that do not require intensive input from the clinical educator. The model assisted clinical educators by providing a framework to guide a paired student placement. When developing the model, it was important to consider the process and logistical issues as well as the impact on both student and clinical educator outcomes. Assessment of participant knowledge and confidence in facilitating peer assisted learning and critical review of stakeholder feedback was essential in recognising the education required and in reaching consensus on the outcome. On completion of the model development workshops, participants were significantly more confident to facilitate peer-assisted learning.

Chapter 4: Traditional versus peer-assisted models of clinical education for paired physiotherapy students: a randomised trial

Preface

Chapter 4 describes the quantitative and survey results from study 2. The design of this study was developed during the stakeholder engagement phase described in [chapter 3](#). Study 1 participants were involved in the development of the method and the design of the data collection tools. This chapter is adapted from a published article by Sevenhuysen SL, Nickson W, Farlie MK, Raitman L, Keating JL, Molloy E, Skinner E, Maloney S and Haines TP. (2014). Educators and students prefer traditional clinical education to a peer-assisted learning model, despite similar student performance outcomes a randomised trial. *Journal of Physiotherapy*.

<http://dx.doi.org/10.1016/j.jphys.2014.09.004>

4.1 Introduction

Health workforce shortages have been identified as a major issue worldwide (WHO, 2006). In Australia, the increasing demand for health care workers is challenging training and service delivery systems (NHWT, 2009). Health Workforce Australia identified “creating a more efficient training system” as an important objective for 2012-2013. There has been a substantial increase in the number of entry-level physiotherapy programs in Australia in the past decade (HWA, 2012), but national shortages of physiotherapists persist (Human Capital Alliance, 2005). Clinical education is a prerequisite for program accreditation (APA, 2009). However, the rising student numbers is challenging the capacity of health service organisations to deliver this fundamental component of physiotherapy education (HWA, 2012).

Assigning multiple students to one educator in physiotherapy clinical placements is one strategy being adopted to cope with this increase in demand and the popularity of the 2:1 or ‘paired’ model – where two students are supervised by one clinical educator – is growing. In theory, the paired model offers an immediate increase in capacity compared to the 1:1 model traditionally used in physiotherapy placements. However, a search of four databases (Medline, CINAHL, SCOPUS and ERIC) up to June 2011 using key search terms synonymous with PAL and physiotherapy yielded no randomised trials and little evidence of the actual effects of paired student models on student, educator or patient outcomes in the clinical setting (Blakely et al., 2009; Lekkas et al., 2007; Moore et al., 2003; Roberts et al., 2009; Strohschein et al., 2002). Physiotherapy clinical educators consider PAL models feasible (Lekkas et al., 2007; Moore et al., 2003; Baldry-Currens and Bithell, 2003) and

some prefer this to the 1:1 model (Baldry-Currens and Bithell, 2003). These authors recommend implementation of the paired student model in physiotherapy and reference the need for clinical educators to be prepared to facilitate peer engagement. Despite the recommendation for the paired model, no studies have provided a reproducible framework, set of activities or specific tools to assist educators and learners in applying the model.

Topping and Ehly (1998) define PAL as "the acquisition of knowledge and skill through active helping and supporting among status equals or matched companions". Implementation of paired student placements might vary for several reasons, such as student and clinical educator preparation, placement environment and the cohesion of the student-peer relationship (Lekkas et al., 2007; Moore et al., 2003; Baldry-Currens and Bithell, 2003; Boud, 1999; DeClute and Ladyshevsky, 1993; Skøien et al., 2009). Peer interactions may take place in a number of ways from purely social support to formalised peer-assisted learning tasks. Definitive evidence supporting which particular aspects of the peer interaction in the clinical setting most contribute to learning and how to maximise the impact on learning outcomes is currently lacking.

Qualitative investigations into physiotherapy education models have reported that the company of another student on placement reduces student anxiety and aids learning (Baldry-Currens and Bithell, 2003; DeClute and Ladyshevsky, 1993; Skøien et al., 2009; Ladyshevsky et al., 1998). No study provided a description or evaluation of the amount or type of peer interaction occurring within the paired placements. A model of paired student clinical education that specifically aims to facilitate PAL may present immediate benefits within the placement and help to develop more sustainable and productive learner behaviours (Leach and Fletcher, 2008). The ability to collaborate with peers is highly valued by workplaces (Sampson et al., 1998) and is particularly important in the provision of effective health care (WHO, 2010).

Therefore, the research questions for this study were:

1. What are the effects of a paired student placement model incorporating specifically facilitated PAL activities, compared to a traditional teaching approach, on student performance outcomes measured by external assessors blinded to group allocation, clinical educators and student self-assessment?
2. What are the effects of these models on the frequency of student and educator participation in different learning/teaching activities, and the effects on their satisfaction with the clinical placement?

4.2 Method

4.2.1 Design

This trial was a prospective randomized cross-over trial comparing two models of physiotherapy clinical undergraduate education: a traditional ('TRAD') paired model and a peer assisted learning ('PAL') paired model (Figure 4.1).

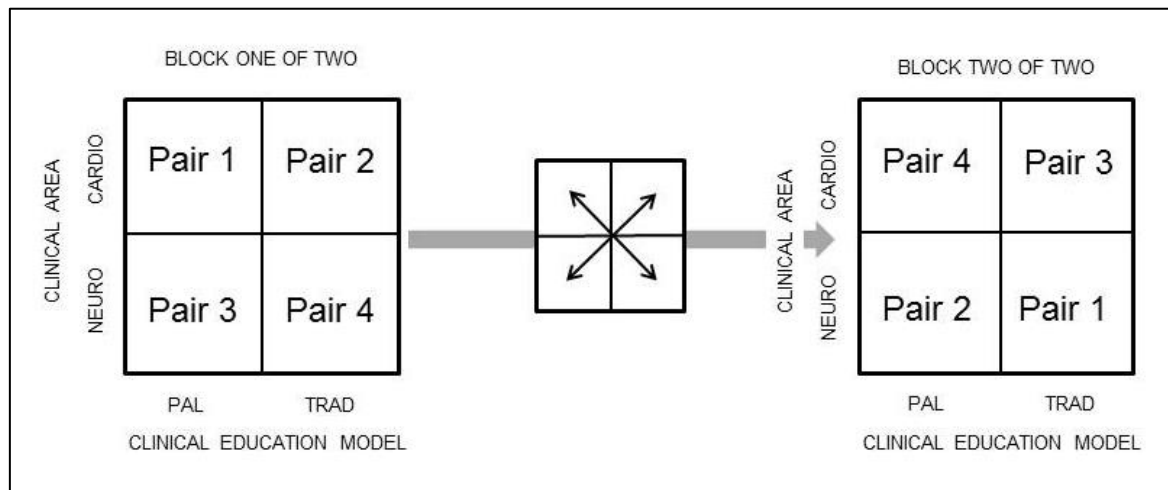


Figure 4. 1 Trial Design ('PAL': peer assisted learning model, 'TRAD': traditional model, 'NEURO': neurological placement, 'CARDIO': cardiothoracic placement)

4.2.2 Setting and participants

The trial was conducted in a tertiary metropolitan health service from June to October, 2011.

Participating sites included three acute hospitals, one sub-acute inpatient centre and one outpatient rehabilitation centre. Physiotherapy students from Monash University, in the third year of a four-year undergraduate degree, were eligible for inclusion if they were allocated to clinical placements at the health service. There were no exclusion criteria.

4.2.3 Procedure

Students were randomly paired and allocated to either traditional or PAL groups for the duration of their 5-week cardiorespiratory and neurology clinical placements. Student pairs remained the same for both placements. Before random allocation occurred, a university staff member who was not involved in the project allocated students to placements at the participating health service based on student preferences. Prior to the commencement of the study, participating clinical educators were engaged in four 2-hour workshops that focused on development and facilitation of a PAL model. Students attended a 2-hour tutorial on the first day of their PAL placement, at which they were introduced to the tools and expectations of the PAL model. Blinded assessors with experience in using the APP were seconded from the university and other health services, and remunerated for their time.

4.2.4 Intervention (PAL model)

In the absence of any published operational 'PAL model', the literature was mined for tools and frameworks that could be used to facilitate PAL between student pairs. Clinical educators participating in the trial worked collaboratively to develop the model, utilizing an iterative process that included four workshops, culminating in consensus (process and outcomes reported in more detail elsewhere) (Sevenhuysen et al. 2013). The final model included a standardized series of tools that were utilized by students and educators during the PAL clinical placements (see Table 4.1) in addition to 'typical' learning activities such as involvement in patient care, team meetings, tutorials and administration. The PAL tools could be used as required, but a minimum number of applications were mandated (see Table 4.1). The minimum frequency was nominated by participating clinical educators in the workshops, based on the literature reviewed, and educator experience and opinions on model feasibility. While the PAL framework encouraged students to work with and learn from each other, the responsible clinical educator had supervisory responsibilities of minimizing risk to patients and students, providing formative and summative feedback and assessment, and providing appropriate education/guidance.

DOMAIN	Feedback				Clinical Reasoning	Risk identification
TOOL	Peer Feedback Book	Educator Feedback Book	Peer Observation Form	Verbal Feedback Triad	SNAPPS	Complexity-Risk Matrix
STRUCTURE	Un-structured	Un-structured	Structured	Un-structured	Structured	Structured
MINIMUM FREQUENCY	2 per student per week	2 per student per week	2 per student per week	1 per pair per week	3 per pair per week	2 per pair per placement

Table 4. 1 The peer assisted learning (PAL) model

4.2.5 Usual Supervision (Traditional Model)

The traditional model involved delivery of supervision according to the usual practice of the clinical educators when supervising pairs of students. This was not standardised but was characterised by supervisor feedback to learners and individualised learning activities including supervised practice, reflective learning and assessment. Students were given the freedom to naturally collaborate, but PAL activities were not scheduled or facilitated.

4.2.6 Measurement

Outcome measures were defined a priori and completed by blinded clinical performance outcome assessors (who were not part of the investigative team), clinical educators and students (self-assessed). It was not possible to blind students or clinical educators to group allocation due to clear differences in the structure of the two education models.

Primary outcome

The primary outcome measure was the Assessment of Physiotherapy Practice (APP), scored by blinded outcome assessors, supervising clinical educators, and students (in self-assessment) at the end of each five-week placement. The APP instrument is designed to monitor longitudinal evaluation of physiotherapy student performance in the clinical environment and has been shown to be reliable (intraclass correlation coefficient [ICC] (2,1) = 0.92, 95% confidence interval [CI] 0.84–0.96) (Dalton et al. 2012). It has been validated against a range of other indicators (for example stability in

hierarchy of item difficulty, global rating scores) when applied by clinical educators who assessed students during at least four weeks of clinical placement (Dalton et al. 2011). The APP is comprised of 20 items in seven key areas that map to the core competencies specified in the Australian Standards for Physiotherapy (APC, 2006). Each item is rated on a 5-level scale from 0 (infrequently/rarely demonstrates performance indicators) to 4 (demonstrates most performance indicators to an excellent standard). The total APP score ranges from 0 to 80, with a higher score representing better performance. The standard error of measurement for the APP is low and the minimal detectable change at 90% confidence was 7.9 (Dalton et al. 2011).

Whilst the supervising clinical educator and the students APP ratings were longitudinal, the blinded outcome assessors completed the APP following a half-day observation of each student within the final three days of their placement. Although no data is currently available on the validity and reliability of the APP when used over a half-day period, the instrument provided the best option as it has construct validity for assessment of the target outcome, was used by students and educators in formative feedback on performance during the placement, was practical and feasible and assessors were experienced in its application. The half-day assessment was chosen as it afforded the introduction of blinded assessment, in comparison to the longitudinal assessments undertaken by clinical educators who could not be blinded to the education model being delivered.

Secondary outcomes

The secondary outcome measures were:

- Satisfaction with the teaching and learning experience on completion of both models (measured via survey), completed by:
 - The supervising clinical educator
 - The student
- Daily statistics

Workplace statistics from clinical educators (e.g. number of patients seen, time spent on administration tasks, direct teaching, student supervision, quality assurance activities etc.). Educator workload statistics were recorded at the end of each day on a form generated during the model development phase (Sevenhuysen et al. 2013). Days where educators were absent were excluded from the results.

Learning activity statistics from students (e.g. number of times treating patients, observing, providing peer feedback, engaging in facilitated peer learning activities etc.). Learning activity

statistics were recorded by students on a daily basis, using a form created by educator participants during the model development (Sevenhuysen et al. 2013). Days where students were absent were excluded from the results.

The Likert scale responses in the surveys were defined as: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.

4.2.7 Analysis

The APP score was compared between groups using linear regression analysis. As this was a cross-over trial, data were clustered by participant and robust variance estimates were calculated to account for this data dependency. The overall between-group result was not adjusted for student characteristics as student participants contributed equally to both groups. When analysing the APP scores by clinical area (cardiothoracic and neurological), the results were adjusted for pre-clinical objective structured clinical examination (OSCE) score. In these clinical area-specific analyses, results were not clustered by participant as each participant only contributed to one education approach within each clinical area.

Educator workload statistics were added across the 5-week block and divided by the number days worked to yield an average number of minutes per day for each category. The between-group difference was analysed using a linear mixed model. In this model, a random-effect term for educator was nested within one for site, while education approach was a fixed effect. The educator survey results were analysed using the Wilcoxon signed-rank test as matched data. The number of student learning activities were added across the 5-week block and divided by the number days present to yield an average number of occurrences per day for each category. The between-group difference was analysed using a linear mixed model regression. The student survey results were also analysed using the Wilcoxon signed-rank test.

4.3 Results

Compliance with the trial method

There were no drop-outs in this study, but four student participants did not consent to being observed by the blinded outcome assessor. Therefore the participant number for this outcome measure is 20 not 24. One educator did not complete the survey. Eight students did not complete the end of unit satisfaction survey.

Characteristics of the participants

The six blinded assessors had more than five years of experience in clinical practice and in clinical education. They had current or recent experience with physiotherapy students, either teaching on-campus and/or as a clinical educator. The 14 clinical educators were mostly aged between 20 and 30 years with a Bachelor level qualification. Their time in clinical practice and in clinical education ranged from <1 to 10 years. The average number of students they had educated per year before the study ranged from one to twelve, indicating variable experience levels. Only one clinical educator felt “very confident” in their clinical education skills and none had prior experience with PAL. Students (n = 24) were mostly aged between 18 and 25 years and two-thirds had completed two years of tertiary education prior to clinical placements (Table 4.2).

Demographic	Category	Blinded Assessors n (%)	Clinical Educators n (%)	Students n (%)
Age	18-20	0 (0%)	0 (0%)	8 (33%)
	20-25	0 (0%)	4 (29%)	13 (54%)
	25-30	0 (0%)	8 (57%)	3 (13%)
	30-35	2 (33%)	2 (14%)	0 (0%)
	35-40	2 (33%)	0 (0%)	0 (0%)
	40+	2 (33%)	0 (0%)	0 (0%)
	Total	6 (100%)	14 (100%)	24 (100%)
Sex	Male			10 (42%)
	Female			14 (58%)
	Total			24 (100%)
Qualification level	Bachelor	3 (50%)	11 (79%)	
	Graduate Diploma	2 (33%)	1 (7%)	
	Masters	1 (17%)	2 (14%)	
	Total	6 (100%)	14 (100%)	
Years of tertiary education	2			16 (67%)
	4			2 (8%)
	5+			6 (25%)
	Total			24 (100%)
Grade employed as	1	0 (0%)	7 (50%)	
	2	2 (33%)	6 (43%)	
	3	4 (67%)	1 (7%)	
	Total	6 (100%)	14 (100%)	
Years of experience in clinical practice	1-3	0 (0%)	5 (36%)	
	3-5	0 (0%)	5 (36%)	
	5-10	2 (33%)	4 (28%)	
	10+	4 (67%)	0 (0%)	
	Total	6 (100%)	14 (100%)	
Years of experience in clinical education	<1	0 (0%)	3 (22%)	
	1-4	0 (0%)	7 (50%)	
	5-10	3 (50%)	4 (28%)	
	10+	3 (50%)	0 (0%)	
	Total	6 (100%)	14 (100%)	
Most recent engagement with physiotherapy students	Current	4 (67%)		
	1-3 years	2 (33%)		
	Total	6 (100%)		
Involvement with students	On campus teaching	1 (17%)		
	Clinical Educator	2 (33%)		
	Both	3 (50%)		
	Total	6 (100%)		
Confidence in clinical education	Neutral		6 (42%)	
	Somewhat confident		4 (29%)	
	Confident		3 (22%)	
	Very confident		1 (7%)	
	Total		14 (100%)	
Average number of students educated per year	1-3		5 (36%)	
	4-6		4 (28%)	
	8-12		5 (36%)	
	Total		14 (100%)	
Prior experience with PAL	No		14 (100%)	
	Total		14 (100%)	

Table 4. 2 Participant demographics

4.3.1 Student Performance

There were no significant differences in the APP scores between the PAL and traditional models, whether awarded by the blinded assessor, the supervising clinical educator or the students.

Similarly, there were no significant differences in the APP scores between the PAL or traditional models when analysed by clinical area (Table 4.3).

	Blinded Assessor APP (n=20)			Educator APP (n=24)			Student APP (n=24)		
	PAL Mean (SD)	TRAD Mean (SD)	Regression coefficient (95% CI), p value	PAL Mean (SD)	TRAD Mean (SD)	Regression coefficient (95% CI), p value	PAL Mean (SD)	TRAD Mean (SD)	Regression coefficient (95% CI), p value
Total Score (max 80)	40.19 (10.80)	42.94 (10.83)	-2.76 (-9.95, 4.43), p=0.430	45.85 (12.20)	45.60 (9.75)	0.25 (-6.94, 7.44), p=0.943	44.25 (8.64)	44.25 (9.76)	0.00 (-4.78, 4.78), p=0.999
Cardio-respiratory unit, total score (max 80)	41.57 (8.54)	43.11 (13.23)	0.01 (-0.82, 0.84), p=0.978	47.10 (7.87)	42.70 (6.23)	-0.29 (-0.62, 0.04), p=0.083	47.10 (7.21)	41.50 (3.31)	-0.19 (-0.52, 0.14), p=0.250
Neuro-logical unit, total score (max 80)	39.11 (12.67)	42.78 (8.61)	0.19 (-0.55, 0.94), p=0.590	44.60 (15.77)	48.50 (13.23)	0.05 (-0.84, 0.94), p=0.909	41.40 (9.36)	47.00 (13.17)	-0.01 (-0.71, 0.69), p=0.982

Table 4. 3 Student performance outcomes as measured by the APP (regression adjusted for pre-clinical OSCE result)

OSCE = objective structured clinical examination, PAL = peer-assisted learning model, Trad = traditional model.

4.3.2 Educator workload

Analysis of educator workload statistics revealed no significant between-group differences in any of the measured outcomes (Table 4.4) with the exception of time spent on direct teaching and non-student-related quality assurance tasks (eg, projects designed to improve the quality of patient care). Despite minimal significant differences in their daily workload data, educators reported that they were more satisfied with the balance of their workload in the traditional model (Table 4.4).

	PAL	TRAD	Linear mixed model coefficient (95% CI)	p value
	Minutes per day – mean (SD)			
Direct student supervision	75.09 (36.95)	79.01 (47.83)	-2.85 (-14.80, 9.10)	0.640
Student related administration tasks	19.10 (13.10)	15.34 (18.51)	2.25 (-2.13, 6.62)	0.314
Direct Teaching	11.05 (11.62)	11.56 (14.66)	-3.70 (-7.22, -0.17)	0.040
Student Assessment	13.58 (19.12)	12.91 (17.13)	-0.01 (-5.43, 5.41)	0.997
Student Feedback	21.49 (12.55)	18.56 (14.65)	3.20 (-0.74, 7.15),	0.112
Non-student related administration tasks	78.71 (58.62)	74.83 (54.69)	5.98 (-5.47, 17.42)	0.306
Non-student related quality assurance tasks	11.17 (18.40)	5.17 (10.93)	5.22 (0.81, 9.62)	0.020
Patient attributable activity	215.28 (76.60)	212.74 (104.15)	-5.05 (-27.65, 17.55)	0.661
Overtime	8.87 (10.20)	7.56 (10.30)	2.55 (-0.28, 5.37)	0.077
	Number per day – mean (SD)			
Patients seen (educator + students)	8.48 (2.75)	8.97 (2.61)	-0.39 (-1.03, 0.26)	0.240
	Likert scale - median (IQR)			
I was satisfied with the balance of my workload this week	2 (2,4)	3 (3,4)	-0.52 (-0.80, -0.24)	0.000

Table 4. 4 Educator workload statistics.

4.3.3 Educator satisfaction

On completion of both models, clinical educators reported that they were less satisfied with the PAL model overall and in the areas of student anxiety, personal stress, time available for client service and their ability to observe and gauge students' clinical ability (Table 4.5).

Statement	PAL	Trad	p
	median (IQR)		
I was satisfied with the model of clinical education	2 (2 to 2)	3 (2 to 3)	0.002
I was effectively able to observe and gauge students' clinical ability	2 (2 to 2)	3 (3 to 3)	0.009
I found the clinical education model personally stressful	2 (2 to 3)	1 (1 to 2)	0.005
There was sufficient time available for client service	2 (2 to 2)	3 (2 to 3)	0.003
The students displayed a high degree of anxiety	2 (2 to 3)	1 (1 to 2)	0.008

Table 4. 5 Educator survey results for each model at the end of intervention (n = 13).

When asked to rate on a Likert scale (1 = strongly disagree to 5 = strongly agree), clinical educators had a neutral response about their confidence in facilitating the PAL strategies during the designated PAL block (median 3, IQR 3 to 4). Clinical educators also had a neutral response when asked if their educational style and behaviours varied substantially for both the PAL and traditional clinical blocks (median 3, IQR 3 to 4). When asked which model they would prefer to use in the future, five educators stated they would use a 'flexible PAL' model, four indicated they would return to a traditional model (but still in pairs), and four did not answer.

4.3.4 Student learning activities

There was no difference in the learning activities that students were exposed to in the areas of clinician observation, working without observation, receiving individual feedback, participating in team meetings, time observed by the educator, administration and statistics. In the PAL model there was more time spent by students observing their peers perform a full assessment and treatment and engaging in specific, facilitated peer interactions. Students received more verbal and written feedback in the PAL model. There was also more time spent in family meetings in the PAL model; however this was reported by a relatively small number of participants. Five of the six pre-determined elements of the PAL model were done significantly more often in the PAL placement, indicating adherence to the trial protocol (Table 4.6).

Learning activities	PAL	Trad	Linear mixed model coefficient (95% CI)	<i>p</i>
	(n/day), mean (SD)			
observed clinician patient management	0.69 (0.90)	0.83 (1.07)	0.16 (−0.47 to 0.79)	0.622
observed another AHP delivering patient management	0.28 (0.41)	0.32 (0.51)	0.04 (−0.28 to 0.35)	0.809
observed peer performing an assessment	0.49 (0.43)	0.34 (0.47)	−0.16 (−0.38 to 0.07)	0.176
observed peer performing a treatment	0.46 (0.46)	0.26 (0.39)	−0.20 (−0.40 to 0.00)	0.056
observed peer performing a full assessment and treatment	0.27 (0.34)	0.11 (0.23)	−0.15 (−0.29 to −0.02)	0.028
worked with peer without direct clinician observation	0.99 (1.41)	0.39 (0.82)	−0.58 (−1.36 to 0.19)	0.140
worked individually without direct clinician observation	1.40 (1.52)	2.01 (1.51)	0.63 (−0.25 to 1.50)	0.161
worked without peer observation	1.82 (1.64)	1.19 (1.59)	−0.64 (−1.59 to 0.32)	0.191
received verbal feedback without peer present	0.61 (0.76)	1.05 (0.96)	0.45 (−0.04 to 0.93)	0.073
received feedback against the APP without peer present	0.10 (0.12)	0.10 (0.12)	−0.01 (−0.05 to 0.04)	0.807
participated in family meeting	0.06 (0.14)	0.01 (0.04)	−0.05 (−0.09 to −0.01)	0.014
participated in team meeting	0.55 (0.64)	0.64 (0.55)	0.12 (−0.23 to 0.47)	0.504
observed by educator performing an assessment	0.77 (0.72)	1.27 (1.23)	0.51 (−0.00 to 1.03)	0.051
observed by educator performing a treatment	0.93 (0.85)	1.40 (1.46)	0.47 (−0.13 to 1.07)	0.122
observed by educator performing a full assessment and treatment	0.41 (0.47)	0.63 (0.74)	0.23 (−0.10 to 0.56)	0.170
observed by educator co-treating with a peer	0.09 (0.21)	0.20 (0.34)	0.11 (−0.04 to 0.26)	0.146
patient-related administration	0.36 (1.31)	0.23 (1.13)	−0.12 (−0.94 to 0.70)	0.777
Statistics	0.07 (0.26)	0.00 (0.12)	−0.07 (−0.21 to 0.06)	0.299
Elements of the PAL model				
discussed a completed SNAPPS form	0.56 (0.30)	0.01 (0.08)	−0.54 (−0.65 to −0.44)	0.000
received written feedback in educator feedback book	0.51 (0.45)	0.20 (0.47)	−0.33 (−0.61 to −0.06)	0.018
received written feedback in peer feedback book	0.37 (0.29)	0.00 (0.00)	−0.36 (−0.48 to −0.25)	0.000
completed Peer Observation Form	0.32 (0.22)	0.07 (0.28)	−0.26 (−0.42 to −0.09)	0.003
completed Complexity-Risk Matrix	0.01 (0.05)	0.00 (0.03)	−0.01 (−0.03 to 0.01)	0.297
received verbal feedback with peer present	0.68 (0.53)	0.31 (0.41)	−0.37 (−0.63 to −0.10)	0.006

Table 4. 6 Student placement profile (n = 24). AHP = allied health professional, APP = Assessment of Physiotherapy Practice assessment tool, PAL = peer-assisted learning model, Trad = traditional model.

4.3.5 Student Satisfaction

On completion of both models, students reported increased stress and reduced satisfaction with the PAL model (Table 4.7). When asked to rate on a Likert scale (1 = strongly disagree to 5 = strongly agree), students reported no difficulty providing or receiving feedback from a peer. They had a neutral response regarding the value of their contributions to their peers' learning and to the value of their peers' feedback on their own learning. Students had a neutral-to-negative response to the value of the contribution the elements of the PAL model made to their learning, with the exception of the clinical educator feedback book (Table 4.8).

Statement	PAL	Trad	p
	median (IQR)		
I was satisfied with the model	2 (1 to 2)	3 (3 to 3)	0.001
In the model I received adequate education from my supervisor	2.5 (1 to 3)	3 (3 to 4)	0.052
I found it difficult to receive feedback from my supervisor	1 (1 to 1)	1 (1 to 1)	0.275
I found it difficult to discuss feedback with my supervisor	1 (1 to 2)	1 (0.75 to 2.25)	0.867
I found educational value from watching my supervisor working with a patient	4 (3 to 4)	3.5 (3 to 4)	0.103
I found educational value in my supervisor’s feedback on my performance	3.5 (3 to 4)	3 (3 to 4)	0.471
I found the model personally stressful	2 (1 to 2)	3 (2 to 3.25)	0.018

Table 4. 7 Student satisfaction results for each model at the end of intervention (n = 16). PAL = peer-assisted learning model, Trad = traditional model.

When asked which model they would prefer to use in the future, 81% students indicated they preferred the traditional model to the PAL model.

Only one student reported an instance where they received conflicting knowledge, feedback or advice from the supervisor and peer, which did not adversely alter the outcome of the placement. One student sought assistance from the University unit coordinator over the duration of the study. The student was undertaking the traditional model at the time of the request for assistance.

Statement	median (IQR)
I had valuable contributions to make to my peer colleagues' learning	3 (3 to 4)
I found it difficult to receive feedback from a peer	2 (2 to 2)
I found it difficult to deliver feedback to a peer	2 (2 to 3)
I found educational value in my peer's feedback on my performance	3 (2.75 to 4)
The SNAPPS form aided my learning	3 (2 to 3.25)
The complexity–risk matrix aided my learning	2.5 (2 to 4)
The peer observation record aided my learning	2 (1 to 3.25)
The peer feedback book facilitated my clinical education experience	2 (2 to 2.75)
The educator feedback book facilitated my clinical education experience	4 (4 to 4)
I found educational value in observing my peer receive feedback from the educator	3.5 (2 to 4)

Table 4. 8 Student perceptions of peer-assisted learning model at the end of both units (n = 16).

4.4 Discussion and Limitations

This study is the first randomised trial investigating a PAL model in the allied health sciences in a clinical education setting and one of few randomised controlled trials to examine clinical education outcomes. Our PAL model produced similar student performance outcomes compared with a traditional approach. A recent randomised controlled trial investigating the use of simulation in clinical education also found comparable student outcomes across different models of clinical education (Watson et al. 2012). This may indicate that ‘traditional’ clinical education can be altered without measurable change in student performance outcomes. Unlike simulation, PAL does not require additional equipment and therefore may be more economically viable for health services and education providers.

Our results demonstrated that students did not have any concerns delivering feedback to, or receiving feedback from a peer, but placed higher value on the feedback delivered by the clinical educator. This finding of learners attributing more value to feedback provided by experts compared with feedback from peers is consistent with feedback studies in higher education (Boud and Molloy, 2013) and medical education (Watling et al., 2012). If PAL tasks could be afforded more value for students, this might play an important role in shifting the traditional view of supervision and feedback from one being led solely by the clinical educator, to one that is clearly shared with learners. Students were provided with tools but were not provided with education relating to the delivery of effective peer feedback or peer coaching. Giving feedback changes status and alters the peer relationship as the person giving feedback becomes an evaluator. Effective feedback and coaching may lead to insights which elevate student perceptions of the feedback they receive from

their peers. This may alter the preference for expert feedback because students may not have been asking questions in a way that helped their peers to gain insights into their practice.

Physiotherapy clinical educators have previously reported that time spent directly teaching students is burdensome (Bearman et al., 2012) and that having students in the workplace takes time away from non-clinical tasks such as administration and quality assurance activities (Sevenhuysen and Haines, 2011). Peer assisted learning works on the assumption that learners are intrinsically motivated, can act in a collaborative manner and do not require the clinical educator to direct all of their learning (Sampson et al., 1999). This notion of reduced reliance on the clinical educator was demonstrated in the results where, in the PAL model, clinical educators spent significantly less time on direct teaching and more time on non-student related quality assurance activities.

Interestingly, the reduction in the burden of direct teaching did not lead to greater satisfaction with the PAL model. This may be because the introduction of the PAL model represented a change in ideology and practice and may have challenged clinical educators' traditional and more familiar practices. A previous study reported that PAL processes challenge expectations of the educator's roles and responsibilities, and require a different understanding of ways of approaching teaching and learning (Sampson et al., 1999). This may also explain why, despite there being no difference in the average number of patients seen or the student performance outcomes, clinical educators reported less satisfaction with the time available for client service and their ability to observe and gauge students' clinical abilities in the PAL model. The implementation of the PAL model as part of a research trial also involved additional data collection and administration, which may have added to the burden for both the clinical educators and students and contributed to dissatisfaction. The data collection was required for the outcomes of the trial, but would not be part of usual practice when implementing a PAL model.

Students in the PAL model did spend more time in formalised PAL tasks without sacrificing other elements of the clinical education placement. This may demonstrate that PAL activities can be utilised in paired student placements without reducing access to other learning activities. It may have indicated that students in PAL were able to use their 'downtime' (e.g. time when, in the traditional approach, they may have been waiting for their clinical educator to direct their learning) to complete the designated PAL tasks.

The rigid structure of the formal PAL activities may have contributed to the dissatisfaction with the model, a notion that is supported by the clinical educators citing a preference for a 'flexible PAL' model in the future. To ensure consistency in the research protocol, the formal elements of the PAL

model were prescribed and did not vary throughout the placement. Principles of learning dictate that an effective teaching strategy involves a progression of increasingly complex tasks as knowledge and skill increase (Merrill, 2009). Although it was theoretically possible to increase complexity of the task within the prescribed activities, this may have been difficult for clinical educators and students to execute given it was their first experience with the tools. If paired student placement models are utilised in clinical education, it may be important to consider incorporating flexibility in the type and number of PAL activities facilitated each week, although the results of the trial may have been different if this approach had been tested.

The time allocated to familiarise students with the tools and expectations of the PAL model in this study may not have been sufficient, and may have contributed to students' relative dissatisfaction with the formal tools and the model itself. Students' willingness to engage in a different learning culture to traditional, teacher-led practices can affect their engagement with PAL (Sampson et al., 1999) and has been recognised as being important to clinical educators (Chipchase et al., 2012). To help address this, it may be of benefit to introduce the various tools in the pre-clinical period and invest time orienting learners to evidence of both the short- and long-term benefits of working with and learning with from and about peers (Baldry-Currens and Bithell, 2003; Boud, 1999; Ladyshevsky et al., 1998; Ladyshevsky, 1995; Moore et al., 2003; Roberts et al., 2009; Sampson et al., 1999; Skøien et al., 2009; Strohschein et al., 2002; Topping and Ehly, 1998). It is also possible that some elements of the PAL model may have greater acceptability to students than others, and this will be the focus of ongoing investigations.

The project was conducted in one health service with one group of clinical educators, which limits generalisability. Clinical educator participants were volunteers and therefore a self-selecting group. Issues may have been missed that related specifically to clinical educators who did not volunteer. For example, clinical educators who volunteered may have been particularly enthusiastic or motivated about their clinical education role. There was potential for response bias in the survey, as participants may have built a relationship with the lead investigator through the research process.

The inflexibility of the frequency of activities within the PAL model was a limitation in this study. It is a challenge in experimental comparative studies in education in that following 'protocol' (keeping the intervention consistent) can be counter to best practice educational principles; i.e., activities are tailored to the individual, modified, and incrementally increased in complexity according to demonstration of learner mastery. It is possible that applying PAL in a structured fashion with a minimum agreed number of tasks limits the generalizability of the findings in the context of more

flexible PAL approaches; however it was necessary to permit measurement of adherence to the protocol in this trial.

The reliability and validity of the APP tool over a half-day observation, as was conducted by the blinded assessors, has not been investigated. Student performance on a 'one-off' case may not be a good predictor of performance on other cases and may not correlate with longitudinal performance measures. However, the APP has construct validity for such application and at the time of report, a superior method for assessment of clinical performance in Physiotherapy clinical education has not been published. In addition, the results did not differ when longitudinal assessments by educators were considered and the APP has been demonstrated to be both reliable and valid under these conditions.

Clinical educators developed and then immediately tested the PAL model, with no opportunity to refine the model based on their practical experiences. Educators and students were learning and testing the model simultaneously, which may have affected the results.

The results of this study suggest that, despite resulting in equivalent student performance outcomes, there is some resistance to using PAL in physiotherapy clinical education from both learners and educators. For learners, expert observation of performance and expert delivered feedback is preferred over peer observation because 'it means more' (more understanding of performance standards, more experience in observation, more strategies for improvement tested). For educators, a strict PAL model may represent threats to patient/student safety, to quality feedback and to well worn, familiar routines in clinical supervision. The resistance needs to be acknowledged, and more studies are required to determine whether the challenge is in the change of routine for both parties (expanding the envelope of comfort) or simply because the PAL activities are not as potent as teacher led activities.

Further research could evaluate whether incorporating PAL activities into a paired student placement in a flexible way optimizes clinical educator and student satisfaction. There may be improvement in clinical educator and student satisfaction if certain PAL activities become more familiar and are incorporated into 'usual practice' or there may remain a strong preference for traditional, supervisor-led learning activities. Longitudinal studies could investigate how students evolve in their peer learning practices over time, and whether these competencies influence their capacities to operate in the workforce.

We still do not fully understand what combination of learning activities and experiences constitute an 'ideal' clinical placement for students. This is one of only a few studies in the allied health

sciences where students have recorded daily statistics enabling a quantitative measure of the student learning activities. There is an opportunity for further research to investigate the relationship between student learning outcomes, student satisfaction and the learning activities and opportunities that are accessed during the placement.

4.5 Conclusion

While PAL activities were integrated into the clinical education of paired students without sacrificing student performance outcomes, both educators and students were more satisfied with the traditional approach. The PAL model provided some benefits to educator workload, with clinical educators reducing time spent on direct teaching and increasing time available for quality assurance activities. Students received more written feedback in the PAL model, but privileged educator feedback over peer feedback. Students and educators cited the rigidity of the model as a source of dissatisfaction. We therefore recommend that clinical educators using a paired student model incorporate flexibility in the type and number of learning activities facilitated in the placement.

Chapter 5: Physiotherapy students and clinical educators perceive several ways that incorporating peer-assisted learning could improve clinical placements: a qualitative study.

Preface

Chapter 5 describes the qualitative results from study 2. This was an important follow-up paper which helped to describe and explain the differing results between the quantitative and qualitative data analysis. Although the analyses of the quantitative and survey data showed little difference between the models in terms of measured outcomes and a preference for the 'traditional' model was reported, the themes in the focus group explained that both educators and students still saw value in PAL. This chapter is adapted from a published article by Sevenhuysen SL, Nickson W, Farlie MK, Raitman L, Keating JL, Molloy E, Skinner E, Maloney S and Haines TP. (2015). Physiotherapy students and clinical educators perceive several ways that incorporating peer-assisted learning could improve clinical placements: a qualitative study. *Journal of Physiotherapy*.

<http://dx.doi.org/10.1016/j.jphys.2015.02.015>

5.1 Introduction

Significant strain is being felt by health services that provide clinical education as university programs and student numbers grow (Universities Australia, 2012) in response to health professional workforce shortages (WHO, 2006). Approaches to clinical education are also being examined for quality and sustainability (Rodger et al, 2008; Storchstein et al., 2002). Clinical educators report that student education can be burdensome and stressful (Bearman et al., 2012; Sevenhuysen and Haines, 2011). Students report that placement experiences can provoke high levels of anxiety (Alzayyat et al., 2014), and sometimes do not provide adequate learning experiences (Rodger et al., 2008).

Universities have adopted student-centered, collaborative learning models, supported by research (Topping and Ehly, 1998), but education in the clinical setting has largely retained traditional models. In physiotherapy clinical education, a clinical educator can supervise one student or more than one student concurrently. Where students work together in pairs or larger groups, clinical educators can consider implementing peer assisted learning. Reviewers in this field have concluded that PAL models both enhance placement outcomes and carry the additional benefit of addressing capacity issues (Briffa and Porter, 2013; Secombe, 2008).

Peer-assisted learning has been defined as "the acquisition of knowledge and skill through active helping and supporting among status equals or matched companions" (Topping and Ehly, 1998). The

company of another student on placement appears to reduce student anxiety and aid learning (Briffa and Porter, 2013; Secombe, 2008; Ladyshewsky, 2004). Advantages for the clinical educator, such as reduced burden, have also been reported (Baldry-Currens and Bithell, 2003; Martin et al., 2004) but without high quality evidence, the 2:1 model cannot be confidently recommended over a 1:1 approach (Lekkas et al., 2007).

How PAL placement models are enacted in practice might differ with placement environment, the effectiveness of the peer relationship, and the beliefs and preparation of the student and educator (Dawes and Lambert, 2010; Bartholomai and Fitzgerald, 2007; Baldry-Currens and Bithell, 2003). Peer interactions can vary from social support to formalised peer-assisted, patient-based learning tasks.

A recent randomised controlled trial (Sevenhuysen et al., 2014) comparing a formalised PAL model with a traditional approach for pairs of physiotherapy students, found similar student performance outcomes. However, both students and clinical educators reported dissatisfaction with the rigidity of the prescribed PAL model utilised in the trial. They reported plans to use more flexible PAL models in the future. This qualitative study utilised focus groups to enable an in depth investigation of educator and student experience of PAL in that trial (Sevenhuysen et al., 2014). This may provide insights into the aspects of PAL that are more satisfactory to incorporate into paired student placement models, which will support further refinement of the PAL model.

The research question was:

- What are the experiences of students and CEs in a paired student placement model incorporating facilitated PAL activities, compared to a traditional paired teaching approach?

5.2 Method

5.2.1 Design

Participants in this study had participated in a prospective cross-over randomised trial (Sevenhuysen et al. 2014) that compared two models of physiotherapy clinical education: a traditional paired model and a peer-assisted learning ('PAL') paired model (Sevenhuysen et al., 2013). Students were randomly paired and allocated to either traditional or PAL for their 5-week cardiorespiratory and neurology placements. Student pairs remained the same for both placements.

The PAL model (Sevenhuysen et al., 2013) included PAL-specific standardised activities in addition to typical learning activities such as involvement in patient care, team meetings, tutorials and

administration. PAL activities could be aligned to student learning needs, but a minimum number were mandated. The traditional model involved usual practices for clinical educators supervising students in pairs. In the traditional model the design of the placement activities was at the discretion of the educator. Students were free to collaborate but PAL activities were not specifically facilitated or scheduled.

After participation in both models, three focus groups of students (FG1, FG2, FG3) investigating student experiences were facilitated by a physiotherapist external to the research team, health service and university. Two focus groups of clinical educators (FG4, FG5) (who also experienced both models) were facilitated by a member of the research team who was employed by the university, but had no relationship with the health service. Both facilitators had extensive experience leading focus groups. Opening focus group questions were broad, designed to invite participants to describe their experiences. Questions then progressively focused on how PAL was utilised and how it contributed, or detracted, from the educational experience in both models. Focus groups were 60 to 90 minutes in duration and were audio-recorded and transcribed verbatim.

5.2.2 Participants

The students were in year three of a four-year undergraduate physiotherapy degree. The clinical educators were physiotherapists from a tertiary metropolitan health service (including acute, sub-acute and community settings) with student supervision responsibilities as part of their role.

5.2.3 Data analysis

Qualitative analysis was based on Thematic Analysis techniques (Miles et al., 2014). Three researchers (SS, MF, EM) independently 'open' coded the data for themes and subthemes. An extended analysis framework was developed cooperatively based on these triangulated codes, cross-checked against transcripts, circulated to all researchers, discussed, and adjusted to reflect key themes in the data.

5.3 Results

Twenty-two students and twelve educators participated in the focus groups. Their demographic characteristics are presented in Table 5.1.

Characteristic		Clinical Educators (n=12)	Students (n=22)
Gender	Male	2 (17%)	10 (45%)
	Female	10 (83%)	12 (55%)
Age	18-20	0 (0%)	15 (68%)
	20-25	2 (17%)	7 (32%)
	26-30	8 (66%)	0 (0%)
	30+	2 (17%)	0 (0%)
Years of clinical experience	< 1	0 (0%)	
	1 - 3	5 (42%)	
	3 - 5	3 (25%)	
	5 - 10	3 (25%)	
	> 10	1 (8%)	

Table 5. 1 Participant demographics

5.3.1 Qualitative Analysis

Three overarching themes emerged from focus group data: 1) what PAL can do 2) what PAL cannot replace and 3) cohesion of the student to student relationship. The subthemes relating to the broader themes are bolded within the text.

Theme 1: What PAL can do

Students described clinical education as a stressful experience, but the presence of a peer alleviated some of the perceived pressure. Participants used 'PAL' as an 'umbrella' term to describe many forms of peer interaction from informal peer support in the lunch room through to formalized patient-based peer learning tasks. Students considered that informal peer support during both PAL and the traditional model, and structured support during PAL, **reduced anxiety** associated with clinical education.

Instead of just being thrown in the deep end, to do a subjective [history taking] on your own, complete an assessment [physical] on your own, it was good to have that person there to bounce ideas off. We could write out a plan together and we followed through together. Just having the confidence, reliance on someone else, made it easier (student, FG2).

The notion of learning through these informal conversations was articulated by the students.

I think I learnt more [in PAL]. We helped each other to reflect. You could talk about what you did and how you could do it differently. We would sit down and debrief with each other and go 'how can we be different tomorrow?' (student, FG2).

Students perceived that the presence of a peer enabled a **safe learning environment**. Students could question, and debrief with, their peer without fear of this impacting on their summative assessment, in contrast to discussions with a clinical educator. This was reported to have occurred informally in both the PAL and traditional models.

Even just asking silly questions you don't want to ask your supervisor because you think you might get marked down. It holds you back from asking some questions I find (student, FG1).

Clinical educators perceived that their **burden was reduced** when students in either the PAL or traditional model provided this level of support to one another, instead of always turning to the educator.

It gives the students someone else to go to as well. If you haven't had a lot of experience it takes the pressure off a little bit because they don't necessarily come to you with every single thing (clinician, FG4).

Students also felt positive about this perceived reduction in reliance on the clinical educator for support. Their comments demonstrated that they were acutely aware of imposing on, or adding strain to, their clinical educators.

It's just being able to bounce things off each other. Our supervisor mentioned that she likes that we could work together, and we felt good about being able to rely on each other (student, FG2).

The **time burden associated with educator driven feedback** was also reduced, as student peers were able to provide feedback to one another. This was enhanced in the prescribed PAL model as students were scheduled times for this to occur each week, resulting in greater frequency of peer

feedback. Educators in both focus groups described being legitimately surprised that student peers would be willing and able to have constructive feedback dialogue with each other.

It could save some time from the [educators] point of view when I am not telling students 'can you make sure the patient is well spoken to' (clinician, FG5).

One of the things I observed when I did verbal feedback with PAL students was the students I observed were quite forthcoming with constructive feedback. The reason it surprised me [was because] when I was a student I would never say something bad about someone I was in placement with because I thought 'that's going to highlight the negative aspect of my peer's performance to my supervisor'. I was actually quite pleased that that didn't seem to be a barrier to providing constructive criticism (clinician, FG4).

Students recognized this additional feedback from different parties as adding to the overall learning experience.

I really appreciated when my peer gave me feedback. It's just a different perspective from the supervisor as well (student, FG3).

Using activities mandated in the prescribed PAL model to maximise 'downtime' in the clinical setting was identified as a significant positive for the clinical educators, compared with the traditional model. Peer assisted learning was perceived to perform a 'double duty' through both adding to the learning experience and aiding the logistics of placement organisation.

They can give each other feedback and work together on problems. I think that is useful rather than sending someone away to do a task and coming back with very little. It's easier when they can bounce ideas off each other. I think they get more out of it and you feel like they've used their ½ hour of downtime for something productive as opposed to disappearing to the library on their own and you're not sure what's been done (clinician, FG5).

Peer assisted learning activities used in 'downtime' were seen as helpful in involving additional staff in clinical education.

It worked well with part time staff. In the past staff that weren't there 8am till 5pm couldn't supervise students. We have staff that are 8am till 3pm and then we could use that extra time to do some PAL activities and discuss it with the senior the next day... things we couldn't do with the traditional model that we could do now with PAL (clinician, FG5).

The prescribed PAL activities were also perceived to maximise the efficiency of the learning experience by helping students to 'get more' out of each patient interaction. The notion that PAL supported structured reflection was raised by educators, and praised by students for helping to generate reflective capacities.

I think it pushed them to reflect more on each individual experience. Because there were so many PAL activities to complete and they picked a different situation for each, they were forced to think about what they were doing and why, what they did well or not so well. Often I think if they didn't have to do those things they would just do it, be done with it and that's kind of it (clinician, FG4).

The teamwork and cooperation required of students in the prescribed PAL model was perceived as an authentic representation of skills required as a health professional. Students and educators reported that PAL helped students to **develop skills in collaboration**.

It's reflective of real life, you're always going to be working with people that are less experienced or bring different things to the table. You need to be able to act accordingly; it's part of your professionalism (clinician, FG4).

Students perceived that the prescribed PAL model helped them to **develop skills in feedback interactions**, and stated explicitly that the mandated feedback as part of the PAL model had 'spilt' into habits even when they were not monitored. Again, educators reported that the ability to watch others and make and communicate judgments on performance was important in the workplace..

We got used to giving each other feedback and now we still do that even though we don't have to... So I guess sometimes you might think you don't want to tell them, offend them, but

because we had to in the beginning now we just keep giving each other feedback (student, FG2).

If you've got a junior staff member and you've asked them to give feedback to a student they would often argue 'I don't know how to give feedback'. If we're skilling our students to give feedback to each other I think it's a good skill to have when they are coming to clinical practice (clinician, FG4).

Theme 2: What PAL cannot replace

In both education models, students described the **importance of observing the clinical educator** to establish the performance benchmark. This expert role modelling was considered something that could not be provided by peers and was particularly important not only in improving the students' own performance, but also in providing appropriate feedback to peers.

You want to mimic, to some extent, what your supervisor is doing. To you, that's the standard. If you can do what they do, then you're going to be hopefully a good physio and get good marks. Early on, to know how to go see a patient, the process you do things, and where they put things when they're getting patients up [out of bed]. I think all those things early on through demonstration are so critical (student, FG3).

Despite both educators and students acknowledging the value of peer feedback, both parties placed substantially **higher value on educator feedback** in both models. Some perceived that peer feedback could lack depth, because students lacked clinical expertise. The notion that educator feedback is more important because the educator is also the assessor was also raised by students.

It [supervisor feedback] ... was more in depth and... more relevant. It might have been that I respect the opinion of the clinician. Not that I don't of my peer, but you respect your clinician a lot more because they have the experience and really know what they're talking about (student, FG1).

[Students] want to know they're doing well from their supervisor because they're the ones that are going to [assess them] (clinician, FG5).

Both educators and students recognised that clinical education is complex and that learning needs, and therefore task sequencing, change depending on the student, educator and setting. The rigidity of the prescribed PAL model was a source of dissatisfaction; both student and educator participants perceived the need for flexible PAL activities that responded to changes throughout the placement. The students highlighted the value of the **clinical educator's guidance** in selecting and facilitating incrementally complex PAL activities tailored to the individual student's progress, rather than strictly following scheduled PAL tasks.

Say your peer was seeing the same patient every day and doing similar stuff, giving them feedback every day on the one thing you're doing is just going to be overkill. First time it might be 'try doing this, or try doing this' but then by the 4th or 5th day you're watching them do pretty much the same thing. I think that seemed like a waste of time sitting, watching and not giving much feedback (student, FG1).

The clinical educators reported being challenged by the mandated frequency of tasks in the prescribed PAL model. Many described their plans to use a flexible model in the future.

I think if you had the flexibility to realise when it's not working and to change things. With this [the prescribed PAL model] it got difficult because there wasn't the flexibility to say this is not working (clinician, FG1).

I really think some of the tools were beneficial and I would incorporate them into a model that was more flexible without the onus of 'we have to do this' (clinician, FG2).

However, clinical educators identified some positives in having a prescribed structure for clinical education.

I think feedback can... [be] forgotten... It [the prescribed PAL model] prompted me to do that and also... [prompted] the two students to give each other feedback (clinician, FG5).

I think, as someone who hasn't done a lot of clinical supervising... [the prescribed PAL model] gives a lot more structure as to how to supervise students and what to do with students (clinician, FG4).

Students described that the value of the activities in the prescribed PAL appeared to diminish towards the end of their clinical placement.

Initially when we were doing it the first couple of weeks I found it pretty good just to set out the information, what I wanted to assess with the patients and get my head around what I was going to do... After a few weeks that benefit wasn't quite as obvious because I was a lot more confident in myself and what I wanted to do (student, FG3).

The clinical educators agreed that, in the future, they would use PAL activities early in the placement and then progress towards independent practice.

I would choose the PAL model, starting the students together and then [the] second or third week separating them, working together on some patients that need more physical assistance (clinician, FG5).

Students and educators **privileged 'hands on' learning experiences** (i.e., doing) over the activities mandated in the PAL model (i.e., observation, feedback, reflection, planning).

You do learn from observing but I feel like the idea of placement is more to get hands on experience, so therefore seeing patients the whole time, whether it's by yourself or with the assistance of your peer (student, FG1).

I think in their mind the idea of a clinical placement it's doing it on a real person. It's not just watching, they've done that at university (clinician, FG4).

Theme 3: Key variable for PAL success: Cohesion of the student relationship

The clinical educators and students referred to the success of PAL strategies being dependent on the **cohesion of the student relationship**. Students proactively initiating PAL activities was considered important for success.

I think it depended on the student... that's a comment I have in general. It really depends on which student you had. Some students were really good, took a lot of initiative and we didn't have to ask a lot of questions at all. We had others that needed more prompting (clinician, FG4).

My partner and [I] were quite different [in] the way we worked, the style of learning. It was hard to coordinate that because I would learn a different way to how he would. Working together wasn't so easy (student, FG2).

Despite these reservations, some students described building effective peer relationships in both models, despite interpersonal differences. Educators considered that students' ability to interact productively with peers was a **marker of their overall capability in practice**. Educators perceived that students who were able to get along, and complete work despite personality differences, demonstrated effective behaviours in communication, team work, and professionalism.

I was told my students didn't get along all that well outside of the clinical placement, but I didn't see that reflected when I supervised them. If that was the case they were both very professional (clinician, FG5).

I think it [the poor peer relationship] was really reflective of this student because his team work and the way he spoke to other staff was horrible... The rapport was never as good as it was with me because he knew I was the one marking him (clinician, FG4).

5.4 Discussion and Limitations

The results of this study reinforce the view that 2:1 (student:supervisor) placement models can enhance the clinical learning experience for physiotherapy students (Briffa and Porter, 2013; Secombe, 2008) because many benefits were described in both paired models. Participants reported that while PAL occurred in the traditional and PAL models, the 'prescribed PAL model' was influential

in establishing positive habits that promoted opportunities for learning such as active observation and peer feedback. Students and educators also reported that the PAL model enhanced the use of 'downtime' that typically frustrated students. Students perceived that the informal PAL, which occurred in both models, reduced anxiety associated with clinical education.

This qualitative analysis explains an outcome of our randomised trial (Sevenhuysen et al., 2014): that some participants would continue with a 'flexible PAL model' despite satisfaction being higher with the traditional model. The in-depth analysis of participant experience also provides insights into aspects of PAL perceived as favorable. Both educators and students reported benefits of informal PAL and additional benefits of a prescribed PAL model. Challenges related to the rigidity of the prescribed activities and mandated data collection associated with a formal research project would be countered by a flexible model.

Peer support in both the PAL and traditional models reduced dependence on the educator. Peer assisted learning may help position students as active learners who are less reliant on the 'expert' educator for feedback and direction. Nevertheless students emphasised the pivotal role that experienced educators play in modelling clinical performance. This direct observation of 'experts' provided a benchmark against which students could evaluate their own performance and the performance of others. Once the benchmark had been established, the efficacy of peer observation and feedback was enhanced. Utilising PAL to develop important skills such as observation and feedback may have a positive effect on students' willingness and ability to teach/supervise when they enter the workplace.

The educators reported that maximising use of 'downtime' was a significant benefit of the PAL model. Creating opportunities for self-directed learning has been identified as important in effective engagement of students in clinical education (Richards et al., 2013). Gordon and colleagues (Gordon et al., 2000) urged educators to "turn downtime into clinical learning time" and "make maximal use of whatever the environment can offer". Empowering educators to design targeted PAL activities to replace unstructured 'independent learning' has potential to improve the efficacy and efficiency of clinical learning.

Students and educators in this study described clinical education elements that cannot be 'replaced' by peer assisted learning. One of the perceived dangers of PAL is that the educator will be made redundant and the 'blind will be leading the blind' (Hattie, 2012; Bloxham and West, 2004). The data from our study does not support that educators are sidelined in peer assisted learning. Skilled educators remained a key component to placement success by designing effective learning

experiences. Earlier studies (Baldry-Currens and Bithell, 2000; Baldry-Currens and Bithell, 2003; Sevenhuysen et al., 2013) suggest that supervising multiple students requires specific educator skills. Educators successfully facilitating PAL are required to model target performances and set expectations and rationale for how PAL interactions might be useful to extend learning. They also need to select and scaffold relevant and appropriate patient-based learning experiences/tasks and guide learners through complex social interactions. Finally, modelling reflective practice and providing individualised feedback are also crucial, educator-led tasks which will support successful peer assisted learning.

Practical or 'hands-on' learning in the clinical environment was valued by students and educators. Although feedback and reflection are considered crucial to learning both students and educators reported 'learning by doing' or 'seeing patients' as the cornerstone of clinical education. Peer assisted learning models may help educators increase feedback and reflection into a culture of 'doing'. Students and educators reported that PAL tasks were more useful early in placement, which is consistent with the principles of scaffolding learning tasks to enable independent practice. Student preference for PAL earlier in the placement has been reported previously (O'Connor et al., 2012) as they seek to demonstrate independence as they approach placement completion.

Student 'compatibility' was described by both students and educators as a key enabler of successful peer assisted learning. In the 2:1 model, the student-student relationship has been identified by students as a stronger influence on learning than the educator-student relationship (O'Connor et al., 2012). Students perceived that the educators played a key role in creating an environment where collaboration was encouraged and competition was minimised. Related content may be important to include in preparing educators to apply PAL models. We found no evidence of peer relationships that were damaging or destructively competitive. This aligns with previous research, where compatibility and competition is frequently raised as a concern but is rarely observed (Baldry-Currens and Bithell, 2003).

This project was conducted in one health service with one group of students and educators, limiting the generalisability of the findings. However, students and educators experienced at least two different placements within the year across five different sites, each with unique workplace cultures and no site-specific differences emerged in the data. Educator participants were volunteers and therefore a self-selecting group. Issues may have been missed that related specifically to educators who did not volunteer. For example, educators who have a particularly negative view of paired student placements and/or PAL may have chosen not to volunteer for the study.

5.5 Conclusion

Students reported that the learning environment created by PAL enabled honest discussion without fear of negative educator assessment. Educators reported that PAL reduced educator burden and that the prescribed PAL model maximised use of downtime and helped students to build professional skills. Students and educators considered that PAL supports clinical learning, but cannot replace educator modelling, feedback and guidance. Cohesion of the student-student relationship was seen as an enabler of successful PAL. Both students and educators described how PAL enabled active learning and reduced dependence on the educator. Students reported that the prescribed PAL model 'forced them' to actively observe practice and learn to communicate evaluative judgments to peers. The role of the educator is not redundant in PAL, but central in designing flexible and meaningful professional practice experiences. In alignment with the results of our randomised trial (Sevenhuysen et al., 2014), both parties reported resistance to the mandated activities and frequencies in the PAL model. Therefore a flexible implementation of activities, to be negotiated by student and educator, is recommended.

Chapter 6: Education in peer learning for allied health clinical educators: a mixed methods study.

Preface

Following completion of the PAL trial in Physiotherapy there were several requests from other allied health professions within the health service for the education session (workshop) associated with the trial. Anecdotally, there was positive feedback for the value of the workshop in assisting Physiotherapy clinical educators to move to a multiple student: educator placement model and other allied health professions expressed interest in moving to this model to increase placement capacity. Given the negative response to the rigidity of the prescribed model in the Physiotherapy trial, the education session was altered to incorporate principals underpinning successful PAL, practical examples of clinical scenarios involving PAL and tools which could be used to support PAL, for clinical educators to use flexibly at their discretion. This led to study 3 which investigated the impact of providing this education session to clinical educators and the results are described in chapter 6. This chapter is adapted from a published article by Sevenhuysen SL, Thorpe J, Barker LA, Keating JL, Molloy EK and Haines TP. Education in peer learning for allied health clinical educators: a mixed methods study. *Focus on Health Professional Education* (under review).

6.1 Introduction

The increasing demand for health care workers globally (WHO, 2006) and the associated challenges of providing health care students with adequate amounts of high quality clinical education are driving innovation in approaches to education in the authentic practice environment. Across Australia, the health sector is currently experiencing (and predicting further) workforce shortages (HWA, 2012). Simultaneously, the tertiary sector is increasing student intake to meet workforce demands (Universities Australia, 2012). The combination of these events is increasing pressure on current allied health practitioners to provide quality clinical education to growing numbers of students.

Moving from the 1:1 clinical educator: student ratio to the 'multiple student to educator' ratio has been offered as a solution to meet the growing demand in the allied health professions. The 2:1, or paired model, where two students are supervised simultaneously by one clinical educator, may offer relief to capacity demands within existing resources (compared with 1:1) and positive examples of its use have been demonstrated in some allied health professions (Avi-Itzhak and Kellner, 1995; Bartholomai and Fitzgerald, 2007; Blakely et al., 2009; Bruce et al., 2001; Claessen, 2004; Ladyshevsky, 1995; Ladyshevsky et al., 1998; Martin and Edwards, 1998; Mason, 1998; Rindflesch

et al., 2009; Roberts et al., 2009; Triggs-Nemshick and Shepard, 1996). The model's benefits have been attributed to PAL, the acquisition of knowledge and skills through a process whereby students (of similar level) work together collaboratively (Topping and Ehly, 1998). The benefits of PAL in clinical education are commonly cited in reviews as improved learning opportunities, increased social support resulting in optimal student confidence levels, improved acquisition of problem solving, self-reflection and evaluation skills and a reduced dependence on the clinical educator (O'Connor et al., 2012; Secombe, 2008; Baldry-Currens, 2003). Productivity gains may also be possible using a paired model (Ladyshevsky, 1995; Ladyshevsky et al., 1998).

Few studies have investigated the effect of paired learning models on measures of competency in allied health professions in the clinical setting. DeClute and Ladyshevsky (1993) examined clinical competency scores for physiotherapy students in a 2:1 compared with a 1:1 model. They found significantly higher scores in all aspects of competency for the paired model. However, this was a retrospective study that did not control for confounding differences in student and educator cohorts. Using a simulated patient in the University setting, Ladyshevsky (2002) examined the clinical performance of students (n=42) in a paired model incorporating reciprocal peer coaching (RPC) compared with students acting independently (n=20). The RPC group outperformed their peers in the individual group in the areas of physical examination, communication and clinical reasoning.

Our team conducted a randomised trial with physiotherapy students to determine the effect of implementing PAL strategies on student performance outcomes (Sevenhuysen et al., 2014). We concluded that PAL activities could be incorporated into the paired model without a detrimental effect on student outcomes. However, both students and clinical educators preferred a traditional approach to paired placements over the prescribed PAL model, with the rigidity of our standardized PAL model cited as the major source of dissatisfaction. The study recommended using a flexible approach which may be more appealing to educators. A flexible approach would also have greater alignment with education principles which suggest that effective teaching involves an individualised progression of increasingly complex tasks as knowledge and skill increase (Merrill, 2009).

Peer assisted learning may or may not occur naturally in a 2:1 model. The literature frequently highlights the importance of establishing the expectations of collaboration, communication and cooperation with those operating in a 2:1 model (Bartholomai and Fitzgerald, 2007; Dawes and Lambert, 2010; Farrow et al., 2000; Flood et al., 2010; Martin and Edwards, 1998; Martin et al., 2004; Moore et al., 2003). Students require "explicit teaching" by clinical educators in the skills of delivering constructive feedback, 'turn-taking' and reflective practice (Sussman et al., 2007). There is

also a need for education of the clinical educator in both the theory and application of PAL to enhance confidence in using the model, address concerns relating to the model's disadvantages, and facilitate best use of a clinical educator's time (Baldry-Currens and Bithell, 2003). Engaging clinical educators in PAL education has been demonstrated to increase self-rated confidence to facilitate PAL in the clinical setting (Sevenhuysen et al., 2013). However, little is known as to whether engaging clinical educators in PAL education will impact on the learning activities students are exposed to, or whether it will enhance the education experience for the student or educator.

The aim of this study was to assess the impact of providing PAL education to clinical educators. Two areas were evaluated: 1) the learning activities undertaken by the student; and 2) the perceptions of the clinical education experience reported by both the clinical educator and the student. Satisfaction with the education provided was also assessed.

6.2 Method

This was a mixed methods study using a stepped wedge design (Brown and Lilford, 2006) as demonstrated by Figure 6.1. The stepped wedge design allows all participants to receive the intervention, although the order in which they receive the intervention is determined at random. The design is recommended where it is predicted that the intervention will do more good than harm, and is particularly relevant for this study as education in clinical teaching methods is highly sought after and carries negligible risk. Quantitative data collected across the project periods (or 'steps') allowed analysis of student activity and clinical educator perceptions in response to the education. Qualitative data was collected via surveys at each 'step' and in focus groups that were conducted at the end of the project period.

The response to the education was measured at four levels:

1. A feedback form was completed by attending clinical educators immediately before and immediately after the education session, to evaluate various aspects of perceived confidence to facilitate PAL using a Likert scale where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.
2. A survey of all clinical educator participants was administered at each step (see Figure 1) to gather information about their clinical education experiences. This included responses to questions addressing educator's perceived confidence and stress levels; perceived changes to education practices; and satisfaction and frequency of facilitating PAL using a Likert scale where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.
3. Students documented various learning activities (including number of times treating patients, observing, providing peer feedback, engaging in facilitated peer learning activities)

during placement across the study period. A tool to measure such activity was not found in published literature, therefore we developed and tested a tool (Student Activity Record) during a pilot study (Sevenhuysen et al., 2013; Sevenhuysen et al., 2014).

4. Qualitative data about the clinical educator and student clinical education experience was collected via focus groups on completion of the data collection period (see Figure 6.1). Additional qualitative data was collected from clinical educators via the open text responses on the survey conducted at each step (see Figure 6.1).

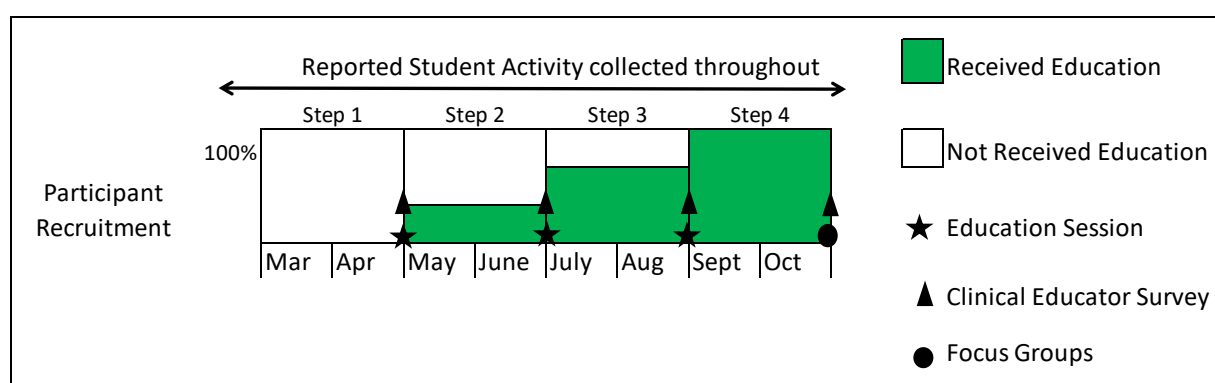


Figure 6. 1 Study design

The trial was conducted in a tertiary metropolitan health service from March to October 2013. Participating sites included three acute hospitals, one sub-acute inpatient centre, one outpatient rehabilitation centre, one community health centre and two inpatient mental health facilities. Allied health clinical educators (clinicians with student supervision responsibilities as part of their clinical role) were invited to participate if they had no previous formal education in peer assisted learning. Clinical educators were assigned one or more pairs of students across the study period, via the usual processes followed within that discipline. They were allocated to one of three education sessions (held approximately 2 months apart) based on logistical considerations.

Students were from various universities within metropolitan Melbourne. Students were invited to participate if they were completing a clinical placement as part of an entry-level program and were being supervised in a pair by eligible clinical educators enrolled in the study. The study protocol was approved by the health service and university human research ethics committees (13073B). Informed consent was obtained from all participants.

The intervention was education in the form of a three hour interactive workshop. The session was designed based on published literature and findings from a trial in physiotherapy conducted in 2011

(Sevenhuysen et al., 2013). The content included the theoretical foundations and the practical applications of PAL (Figure 6.2).

PAL WORKSHOP OBJECTIVES
<p>At the completion of the training, participants will be able to:</p> <ul style="list-style-type: none"> • Demonstrate how to structure a paired student placement utilising PAL tools & activities • Identify how to utilise the advantages & minimise the disadvantages of paired placements • Discuss approaches to management of sub-optimal peer relationships

Figure 6. 2 The PAL education session learning objectives

Quantitative data analysis was conducted using STATA IC version 13. The responses relating to perceived confidence to facilitate PAL immediately before and after each education session were pooled across steps and compared using the Wilcoxon signed-rank test for matched data.

Differences in clinical educator survey responses comparing periods when educators had not been exposed to the education intervention and when they had been exposed, were examined using ordered logistic regression with fixed effect terms for the exposure to the intervention and the step (time period) in the stepped wedge design (treated as a categorical variable). Analysis included clustering by participant study ID so that the analysis would appropriately account for repeated observations by individual participants using robust variance estimates.

Rates that students participated in different learning and feedback activities were compared for periods when their clinical educators had not been exposed to the education intervention and when they had been exposed. Mixed effects negative binomial regression was used with fixed effect terms for the exposure to the intervention and the step (time period) in the stepped wedge design (treated as a categorical variable). Random effect terms were used for student, nested within educator, nested within professional discipline to account for the multi-level structure of this data.

The qualitative data was coded independently by two authors (S.S. and J.T.) using thematic analysis (Miles and Huberman, 1994) to uncover key themes. Disagreements were negotiated through consensus, thus adding rigour to the analysis process (Bearman and Dawson, 2013). The results were reported back to participants for further validation.

6.3 Results

6.3.1 Demographics

Clinical educators (n=30) from seven allied health professions, working in acute, subacute, community and mental health settings participated (see Table 6.1). All but two clinical educators felt confident or very confident in their clinical practice abilities. In contrast, only 60% were confident in their clinical education abilities. Four of 30 clinical educators had prior experience with PAL, but no formal education. Students (n=69) from seven allied health professions participated (see Table 6.1).

Demographic	Category	Clinical Educator, n (%)	Student, n (%)
Age	20-25	4 (13%)	
	26-30	12 (40%)	
	31-35	7 (23%)	
	36-40	3 (10%)	
	40+	4 (14%)	
Gender	F	26 (87%)	56 (81%)
Discipline	Dietetics	3 (10%)	8 (18%)
	Exercise Physiology	1 (3%)	2 (4%)
	Music Therapy	3 (10%)	4 (9%)
	Occupational Therapy	7 (23%)	11 (24%)
	Physiotherapy	4 (13%)	11 (24%)
	Podiatry	4 (13%)	2 (4%)
	Social Work	8 (27%)	7 (16%)
Qualification Level	Bachelor	24 (80%)	
	Graduate Diploma or Certificate	3 (10%)	
	Masters	3 (10%)	
Years of Clinical Practice	1 to 2	1 (3%)	
	3 to 5	14 (47%)	
	6 to 10	10 (33%)	
	Greater than 10	5 (17%)	
Years of Clinical Education Practice	Less than 1	5 (17%)	
	1 to 2	7 (23%)	
	3 to 5	9 (30%)	
	6 to 10	8 (27%)	
	Greater than 10	1 (3%)	
Confidence in Practice	Neutral	2 (7%)	
	Confident	18 (60%)	
	Very Confident	10 (33%)	
Confidence in CE	Not Very Confident	1 (3%)	
	Neutral	11 (37%)	
	Confident	18 (60%)	
Prior Experience with PAL	Yes	4 (13%)	
Year of Tertiary Study	2nd year		7 (10%)
	3rd year		34 (48%)
	4th year		14 (20%)
	Masters		13 (18%)
	Not recorded		3 (4%)
University	Monash University		57 (83%)
	Latrobe University		3 (4%)
	University of Melbourne		4 (6%)
	Deakin University		1 (1%)
	Australian Catholic University		1 (1%)
	Not recorded		3 (4%)

Table 6. 1 Participant demographics. CE = clinical educator

6.3.2 Participant flow

Thirty-six clinical educators attended the education sessions. Of those, 32 went on to supervise or co-supervise 69 different students, in pairs. Where students were co-supervised, both clinical educators attended the education session. Seven students participated in two placements within the study period (supervised by different clinical educators). Thirty of the 32 clinical educators (94%) who supervised pairs of students completed the survey and 14 (44%) participated in the focus groups. Forty-seven of the 69 (68%) students returned completed activity records and 36 (52%) participated in the focus groups (Figure 6.3).

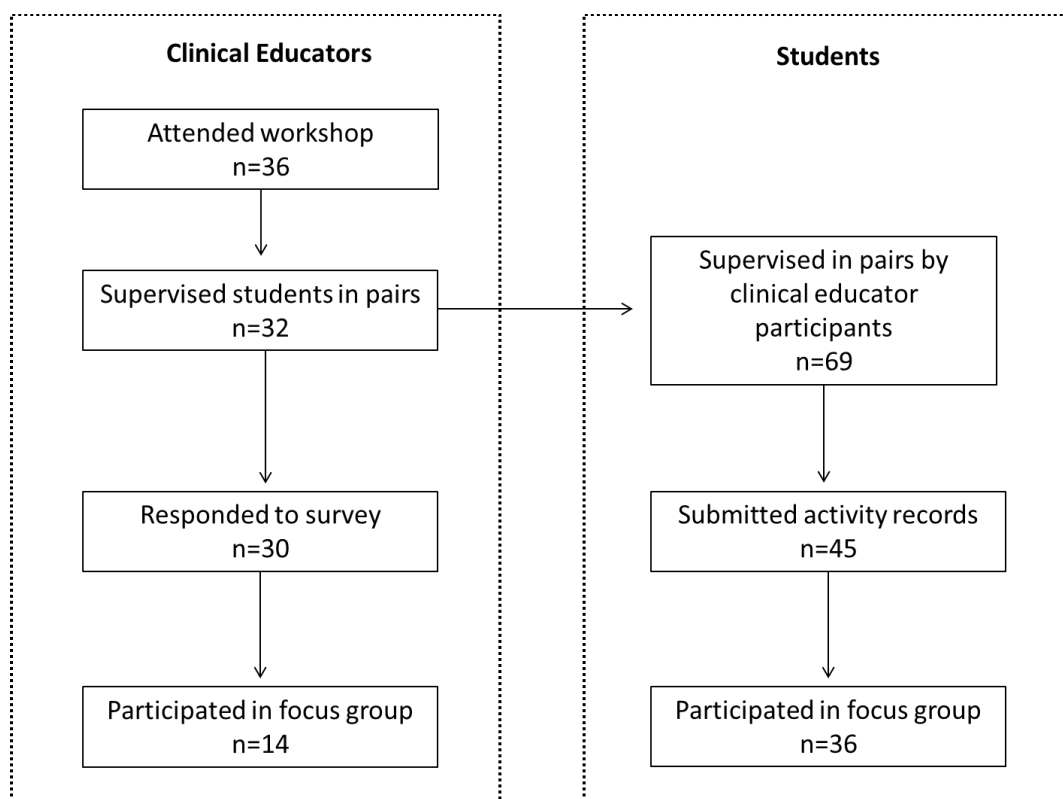


Figure 6. 3 Participant flow-chart.

6.3.3 Workshop Evaluation

Participants found the workshop useful (25%) or very useful (75%) and significant improvement was reported in ability to structure, maximise the advantages and minimise the disadvantages of a PAL placement (Table 6.2).

Statement	Pre	Post	p
	Median (IQR)	Median (IQR)	
I can demonstrate how to structure a paired student placement utilising PAL tools & activities	2 (1,2)	4 (4,4.25)	0.00
I can identify how to utilise the advantages & minimise the disadvantages of paired student placements.	2 (1.75,3)	4 (4,4)	0.00
I can discuss approaches to management of sub-optimal peer relationships.	2 (1.75,3)	4 (4,4)	0.00

Table 6. 2 Education session evaluation results. 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

6.3.4 Clinical Educator Survey

Table 6.3 shows results from the clinical educator survey. There was a significant response ($p=0.04$) to the education for the statement: “My education style and behaviours had changed recently”, with the median moving from ‘disagree’ to ‘agree’. No significant responses to education were demonstrated in the statements relating to student anxiety, clinical educator burden or the perceived effectiveness of clinical education provided. Although there was a change in the median response to the statements “I facilitated peer-assisted learning activities with my students” and “I was satisfied with the outcome of the peer-assisted learning strategies I used with my students” over the time periods, this did not reach statistical significance.

	Before education	After education	
STATEMENT	Median (IQR)		p
I was effectively able to observe and assess students’ clinical ability/competency	4 (4,4.5)	4 (4,4)	0.56
Providing clinical education was personally stressful	2 (2,3.5)	3 (2,3.75)	0.63
There was sufficient time available for client service	4 (2,4)	4 (3,4)	0.26
My students displayed a high degree of anxiety	3 (2,3.5)	2 (2,3)	0.60
The clinical education I provided was effective	4 (4,4)	4 (4,4)	0.12
My clinical education duties were burdensome	3 (2,4)	3 (2,3.75)	0.63
I facilitated peer-assisted learning activities with my students	2 (1,3)	4 (3,4)	0.51
My educational style and behaviours have changed recently	2 (2,3)	4 (3,4)	0.04
I was satisfied with the outcome of the peer-assisted learning strategies I used with my students	1 (1,3)	3 (2,4)	0.33

Table 6. 3 Clinical educator survey results. 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

6.3.5 Student Activity Records

In 17 of the 21 items recorded by students, there were no significant changes in activity undertaken on placement (Table 6.4). Significant variations were found both within and between disciplines in the type and number of learning activities students were undertaking. After clinical educator attendance at the education session, students were twice as likely to observe their clinical educator perform an assessment, twice as likely to observe their peer perform an assessment, 34% less likely to be observed by their clinical educator when performing a treatment and 40% less likely to work with patients independently (without clinical educator or peer).

	Before education	After education		
Activity	Frequency (occurrences/week) Mean (SD)		IRR (95% CI)	p
Student observed clinical educator performing an assessment	2.01 (3.25)	3.19 (3.23)	2.08 (1.06-4.09)	0.03
Student observed clinical educator performing intervention	3.15 (4.28)	1.94 (2.95)	0.90 (0.49-1.65)	0.73
Student received oral feedback - without peer present	3.00 (4.09)	3.48 (3.08)	1.47 (0.94-2.29)	0.09
Student received oral feedback - with peer present	2.32 (3.14)	2.34 (3.02)	1.09 (0.63-1.88)	0.76
Student received written feedback from clinical educator	1.57 (8.65)	0.78 (1.29)	0.54 (0.25-1.17)	0.12
Student received written feedback from peer	0.28 (0.77)	0.40 (0.86)	2.08 (0.72-5.95)	0.17
Student received feedback related to placement assessment - without peer present	0.83 (1.29)	0.81 (1.23)	0.78 (0.42-1.44)	0.43
Clinical educator observed student performing an assessment	2.14 (3.15)	1.92 (2.73)	1.16 (0.81-1.68)	0.41
Clinical educator observed student performing a treatment	4.19 (5.59)	1.59 (2.96)	0.66 (0.46-0.94)	0.02
Clinical educator observed student performing a full assessment and treatment	1.06 (2.22)	0.57 (1.39)	0.81 (0.44-1.50)	0.50
Clinical educator observed student pair with a patient	1.95 (4.46)	0.90 (1.73)	1.03 (0.57-1.84)	0.93
Student observed peer performing an assessment	1.04 (1.76)	2.04 (1.50)	1.99 (1.22-3.25)	0.01
Student observed peer performing a treatment	1.33 (2.17)	0.58 (1.24)	0.95 (0.46-1.94)	0.89
Student observed peer performing a full assessment and treatment	0.44 (1.29)	0.19 (0.59)	0.43 (0.09-2.13)	0.30
Student worked with patient independently (without clinical educator or peer)	6.33 (7.61)	4.88 (4.99)	0.6 (0.39-0.91)	0.02
Student worked with patient and peer (without direct clinical educator observation)	2.39 (5.42)	1.23 (1.98)	0.76 (0.32-1.79)	0.53
Student worked on patient related preparation/admin independently	7.48 (7.52)	8.28 (6.15)	0.97 (0.69-1.35)	0.84
Student worked on patient related preparation/admin with peer	3.11 (3.67)	2.22 (2.52)	1.47 (0.78-2.76)	0.23
Student worked on non-patient related tasks independently	2.01 (2.90)	4.11 (2.88)	0.81 (0.52-1.26)	0.36
Student worked on non-patient related tasks with peer	0.92 (1.56)	1.24 (1.85)	1.22 (0.53-2.83)	0.64
Number of patients seen	18.43 (16.31)	14.21 (10.40)	1.04 (0.84-1.29)	0.72

Table 6. 4 Student Activity Record results

6.3.6 Open survey questions and Focus groups

Key themes were derived from the open questions on the survey and from the six follow-up focus groups (Table 6.5). Three hundred and fifty seven comments were documented under three main themes. The largest number of comments related to participants' perception that PAL enhanced the learning environment. Both clinical educators and students commented that PAL requires additional skills and preparation to be successful. Finally, a number of PAL challenges were identified, including student compatibility, structuring PAL in the unpredictable clinical environment and reduced time for 1:1 feedback.

No. of comments (% of overall)	Theme	Sub-theme	Illustrative quotes
221 (62%)	PAL enhanced the learning environment	Greater learner autonomy	<p>'We like the responsibility and the respect we've been given to formulate that [PAL] time ourselves... I think everyone else could use their time responsibly. I think it's important to own the time rather than your supervisor' (student).</p> <p>'By week five they were seeing patients on their own [in the PAL placement]. Obviously, we choose the patients they will see, but they were seeing patients on their own. In other placements, they might not see patients on their own till week eight' (clinical educator).</p>
		Improved learner confidence and reduced anxiety	<p>'It certainly is less daunting when you're speaking to patients first time, learning those skills it's good to have someone by your side I guess. Having that emotional support and having someone you can debrief with and if you're ever unsure of anything check in with them, check your understanding and make sure you're not doing the completely wrong thing. I felt a lot more comfortable' (student).</p> <p>'I found that if I delegate a patient to both of them they perform much, much better with the patient rather than being one on one. They learn from each other, they exchange ideas, things like that' (clinical educator).</p>
		Improved feedback capability	<p>'I guess you become more confident in giving feedback and become more skilful and tailor it' (student).</p> <p>'Towards the end, I think they're better at giving feedback to one another... which takes the pressure off you giving the feedback all the time. Often if they're</p>

			giving feedback to each other, they're picking up on things you would pick up anyway' (clinical educator).
		Increased collaborative skills	'In a hospital setting where you have to work in a team and working with other people, which is really important with PAL, but it's very important with day-to-day work' (clinical educator).
91 (25%)	PAL requires additional skills & preparation	Facilitating PAL is a skill which takes time to develop	'There had to be structure, there had to be their feedback time and making it clear that was feedback time and making sure they had formal supervision one on one but also peer supervision together' (clinical educator).
			'I think for us it's the initial process of learning, I am hoping by next year we will be able to do it more quickly and have a better system in place' (clinical educator).
		Preparation is critical for success	'I think it depends, you can certainly tell the ones [clinical educators] that have had their education compared to the ones that hadn't' (student).
45 (13%)	PAL challenges	Structure of PAL in the busy environment	'I found in the end it became less formal than I wanted it to be. That's just my day because we're used to changing things on the run and I found it really difficult to keep the PAL model formalised in that setting' (clinical educator).
		Cohesion of the student relationship	'You need to have rapport, you can't do it with just anyone, you need to have rapport with your peer, if you have no rapport you won't get anywhere' (student).
		Reduced individualised feedback	'I think the supervisor realising that you are two different people is really important' (student).

Table 6. 5 Qualitative themes and sub-themes from the survey and focus groups.

6.4 Discussion and Limitations

This multi-method study is the first to analyse the effect of educating clinical educators in the practice of PAL across multiple allied health professions. The qualitative data collected indicates that clinical educators and students experienced many benefits using PAL and that education in facilitating PAL appeared to have played a role in preparing them to successfully implement a sustainable PAL model. After attending the education session, clinical educators reported a perceived recent change to clinical education practices, but not specifically in the area of facilitating PAL. Both these reports were supported by student activity records which demonstrated changes in the frequency of some learning activities undertaken, but most significantly in the area of observation rather than PAL.

In discussing experiences with the PAL model, participants identified key elements that contributed to enhancing the learning environment. Firstly, the presence of a peer enabled sharing of ideas and experiences that students used to build upon existing knowledge. Clinical educators reported this facilitated greater autonomy in students. Clinical educators could assign a patient-based task (assessment, interview, intervention) to two students, confident that together they were more likely to perform the task safely and reach the desired outcomes. This is meaningful because learning environments that encourage students' participation in patient care have been identified as important contributors to learning (Newton et al., 2014). Secondly, clinical educators identified that the mutual support peers could offer each other gave the students more confidence, enabled debriefing (including the acknowledgement of emotions) and instilled a sense of belonging- all aspects that facilitated an improved learning environment. Students and clinical educators indicated that students could ask each other questions that they would hesitate to ask a clinical educator for fear of judgement and the possible effect on assessment outcomes. These findings are in line with previous research (Secombe, 2008; Baldry-Currens, 2003; Blakely et al., 2009; Martin et al., 2004; Ladyshewsky, 1993) and supported by a further study investigating the conditions under which learning occurs naturally within groups (Edmondson, 1999). The study concluded that a climate of safety and supportiveness enabled group members to embrace error, seek feedback and make positive changes to output. Reducing fear and increasing confidence may also improve learners' responsiveness to feedback (Eva et al., 2012).

Although the data revealed a small number of statistically significant changes in reported student activity in response to education, the qualitative data from both students and clinical educators highlighted the importance of preparation for PAL placements. Clinical educators and students praised the role of the education on improving the PAL experience. It is possible that the education may have altered the structure and potentially enhanced the effectiveness of PAL already occurring, without impacting on the reported frequency of various activities. This notion was evident in the qualitative data:

'Before I did the PAL workshop when they would observe each other, I would say "just sit in and take notes down". Since PAL I made it more formalised with all the things they should be looking out for and a comments section. I would give them that and at the end they would give feedback. I think that helped because they had something to do, they were more active. It made them, I guess, be more part of it' (clinical educator).

Two items demonstrating a significant effect from education were an increase in observations students made of their clinical educator and peer. Observing a clinical educator in action is a way of

establishing the benchmark or performance standard, enabling students to compare their own or their peers' performance and provide effective feedback (Archer, 2010; van de Ridder et al., 2008). The education session provided in the study outlined the rationale behind collaborative learning including theory of the steps of learning, importance of observation as a foundation for understanding what needs to be learned, and reflection as a means to make adjustments and build upon existing knowledge (Johnson and Johnson, 1990). Attendees were provided with specific observation and reflection tools for use with students. This aspect of the education may have resonated with the participants and may have been easier to implement immediately after the session, in comparison with other, more complex PAL tasks. This may also explain why a similar increase in peer observation was also reported by students after the education session.

Both clinical educators and students commented that PAL helped students develop important skills for the workplace. The collaboration required of students to successfully participate in PAL was perceived as building skills such as communication, negotiation and teamwork, which may have implications for their future practice as health professionals (Hall & Weaver, 2001). Students also reported developing skills in observation, evaluative judgement and feedback through PAL, which may impact on capacity to educate students and colleagues in the future.

Learning to facilitate PAL was reported by clinical educators as a complex skill that required application and ongoing practice and refinement in the workplace. It is possible that the amount of PAL occurring may increase over the longer term, as clinical educators consolidate their skills, and this may explain why significant changes were not reported in other PAL activities during the study period. This may also explain why the statement "I facilitated PAL" moved from "disagree" to "agree" on the clinical educator survey across the study period. Further research is warranted to investigate the longer term effects of participation in PAL on both student and clinical educator outcomes.

The reported student activity data indicated that students were less likely to be observed by their clinical educator when performing a treatment and less likely to work with patients independently (without clinical educator or peer) after their clinical educator attended an education session. It may be that some elements of clinical placement activity were reduced to accommodate the increased observation. The effect of this change on students learning outcomes is not known, and further research is required to determine how exposure to various learning activities influences student performance.

Providing education only to clinical educators may have been a limitation in this study design and this limitation was identified by participants in the qualitative data. To promote students as active learners, ideally both clinical educators and students could be involved in education and preparation for PAL.

This project was conducted in one health service with one group of clinical educators, which limits generalisability, though engaging multiple allied health disciplines was a strength in this respect. Clinical educator participants were volunteers and therefore a self-selecting group. Issues may have been missed that related specifically to clinical educators who did not volunteer. For example, clinical educators who volunteered may have been particularly enthusiastic or motivated about their clinical education role or PAL. There was potential for response bias in the survey, as participants may have built a relationship with the lead investigator through the research process. Participant survey responses may also have been influenced by the information they received in the workshop, allowing for greater recognition of PAL activities that were previously not recognised as such.

6.5 Conclusion

Education in facilitating PAL improved the perceived confidence of clinical educators and resulted in a self-reported change in their education behaviours. There was a statistically significant increase in the reported incidence of students undertaking observation of their clinical educator and their peer, and a reduction in independent work with patients. Both student and clinical educator participants reported that PAL enhanced the learning environment, but noted that education and preparation are important to mitigate challenges associated with managing peer relationships and maintaining individualised feedback. Students reported the benefits of PAL in improving agency, reducing anxiety associated with clinical placements, and improving their capacity to give and receive feedback. Modifications to the education session such as supporting clinical educators to maintain individualised feedback in the PAL model, and the development of a PAL education session for students, may be considered to address issues raised in this study and further the potential for effective PAL in the clinical education setting.

Chapter 7: Implementing peer-assisted learning in clinical education.

Preface

Following the physiotherapy and multidisciplinary trials there were more requests for PAL education sessions for clinical educators across Victoria and the ACT. The anecdotal feedback from these workshops was that the mix of theoretical principles and practical examples was particularly useful for busy clinical educators. This prompted the development of the following paper which aims to assist educators in implementing PAL in the clinical setting. It is based on the results from the systematic review, both trials and the experience of delivering multiple education sessions. Chapter 7 is adapted from a published article by Sevenhuysen SL, Kiegaldie D, Haines TP and Molloy EK. (2016). Implementing collaborative and peer-assisted learning in clinical education. *The Clinical Teacher*. 13: 1-7.

7.1 Introduction

Peer-assisted learning is defined as learning that occurs when “people from similar social groupings who are not professional teachers help each other to learn and learn themselves by teaching” (Topping, 1996). Approaches that promote PAL in health professional education are becoming increasingly common, varied and generally well accepted (Pluta et al., 2013). PAL includes activities that involve two or more learners working together for the purposes of achieving learning outcomes, with a focus on developing professional collaboration and feedback skills. PAL may also assist students to learn how to teach.

This paper has been written for clinical teachers implementing PAL models in healthcare, to assist them in overcoming the challenges which PAL may present. Using the capability – opportunity - motivation behaviour change (COM-B) model (Michie et al., 2011), the paper will present a range of strategies that encourage active participation in PAL to maximise the benefits for students and teachers. It has been developed based on current literature and the authors’ experience in developing and testing PAL models of undergraduate clinical education in medicine and allied health.

Commonly cited benefits of PAL include improved learning opportunities, reduced student anxiety, improved problem solving, clinical reasoning and evaluation skills and a reduced dependence on the clinical teacher (Ladyshevsky, 2002; Ladyshevsky, 2004; Pluta et al., 2013; Topping, 1996; Sevenhuysen et al., 2013; Sevenhuysen et al., 2015; Tai et al., 2015; Tai et al., 2016). Despite these positive outcomes, utilising PAL in the clinical environment presents challenges (Sevenhuysen et al., 2014; Bennett et al., 2014) and clinical teachers cannot simply co-locate students and expect PAL to naturally occur (Pluta et al., 2013; Sevenhuysen et al., 2015). For PAL to be successful, it is not

enough for teachers to have a philosophical commitment to facilitating learning amongst student peers (Pluta et al., 2013). Specific activities must be identified and effective implementation demands that teachers work not necessarily harder, but differently (Topping, 2005).

Introducing PAL in clinical education requires thoughtful planning pre-placement and specific skills are required by clinical teachers to utilise it effectively (Sevenhuysen et al., 2015). Both students and teachers may be resistant to PAL because they perceive it is better to learn from the 'expert' and are often comfortable operating in a system, with defined roles, that they have learned to navigate (Sevenhuysen et al., 2015; Bennett et al., 2014).

For the purposes of this paper, a PAL clinical education model is an umbrella term describing any multiple-student to clinical teacher model incorporating PAL. A clinical teacher is defined as a health professional with student responsibilities as part of their clinical role.

7.2 Method

The paper was developed based on current literature and the authors' experience in developing and testing PAL models of undergraduate clinical education in medicine and allied health.

7.3 Results: The COM-B Model for implementing PAL in clinical education

The COM-B ('capability', 'opportunity', 'motivation' and 'behaviour') model (Michie et al., 2011) is a behaviour change framework, developed via systematic review and expert consultation. The framework has been applied in research into changing behaviours in health, and can be extrapolated to the education context.

Capability

To assess and build on the capability to implement PAL, it is important for clinical educators to reflect on their own capabilities and have an awareness of students' previous exposure to PAL and the resources required for implementation.

What is the students' previous exposure to PAL?

Peer assisted learning is widely used as a strategy in many health professional tertiary programmes. It is therefore likely that students will have had some experience with PAL (e.g. problem based learning, clinical skills teaching, peer-assisted study sessions etc.), but may not automatically take the opportunity to use it in the clinical setting (Tai et al., 2014). Clinical educators should gather information on how PAL is utilised in the pre-clinical setting and consider how this can be translated to their clinical context (e.g. using the problem based learning format to research and present a case).

What resources could be available?

Clinical educators who are new to PAL may not feel confident in implementing the approach without further training (Sevenhuysen et al., 2013). Reflection on their own skills and experience with PAL will help educators identify and address areas of education need. Although PAL initiatives draw largely on the resources and engagement of students and educators, it may also require input from other staff. To share the load, educators may consider using clinicians and educators both from within their profession and from other professions to supervise and/or facilitate appropriate PAL activities to encourage cross fertilisation of ideas and strategies.

Opportunity

Creating opportunities for PAL in the clinical setting takes careful planning. This includes identifying activities, scheduling sessions, encouraging student autonomy and individuality, ensuring explicit educator involvement and promoting critical reflection.

Planning for PAL

To maximise student engagement, we suggest specifically timetabling PAL sessions, particularly early in the placement. This sets the expectation that students will work together, demonstrates that PAL is important in the placement model and helps students to develop skills and behaviours (such as active observation and providing feedback) which may become more habitual as the placement progresses.

There are many types of PAL which can be utilised in the clinical setting. Prior to the placement starting, clinical educators should spend time considering what types of PAL may be suitable for their context and the clinical activities that could be included (see Box 7.1).

Typology	Example of clinical activities
Peer tutoring or teaching	Teaching a concept or skill to a peer. Researching relevant topics and teaching each other.
Peer collaboration	Working together on a task such as taking a patient history. Brainstorming ideas for diagnoses or interventions. Preparing and presenting a case together.
Peer co-operation	Dividing learning tasks amongst peers, such as components of a patient history, assessment and/or treatment, with everyone putting their findings together to achieve a joint goal.
Peer monitoring	Observing other students, without any requirement for the observer to make any judgement or assessment of the peer.
Peer observation	Students 'actively observe' other students with the objective of providing subsequent feedback (this may be more effective if a 'prompting sheet', checklist or rubric is provided).
Peer coaching	Based on an observation, providing suggestions for enhancing or remedying performance, in addition to commentary on performance.
Peer feedback	Practicing clinical examination tasks and providing feedback to one another on the quality of an observed performance.
Peer assessment	Student peers formally assess one another against specific criteria.

Box 7. 1 Examples of types of PAL in the clinical setting

Encourage student autonomy and flexibility

Clinical educators should consider how PAL sessions will be initiated – these may be timetabled in the early stages, but as the placement progresses students may take ownership and initiate their own PAL (see Figure 7.1).

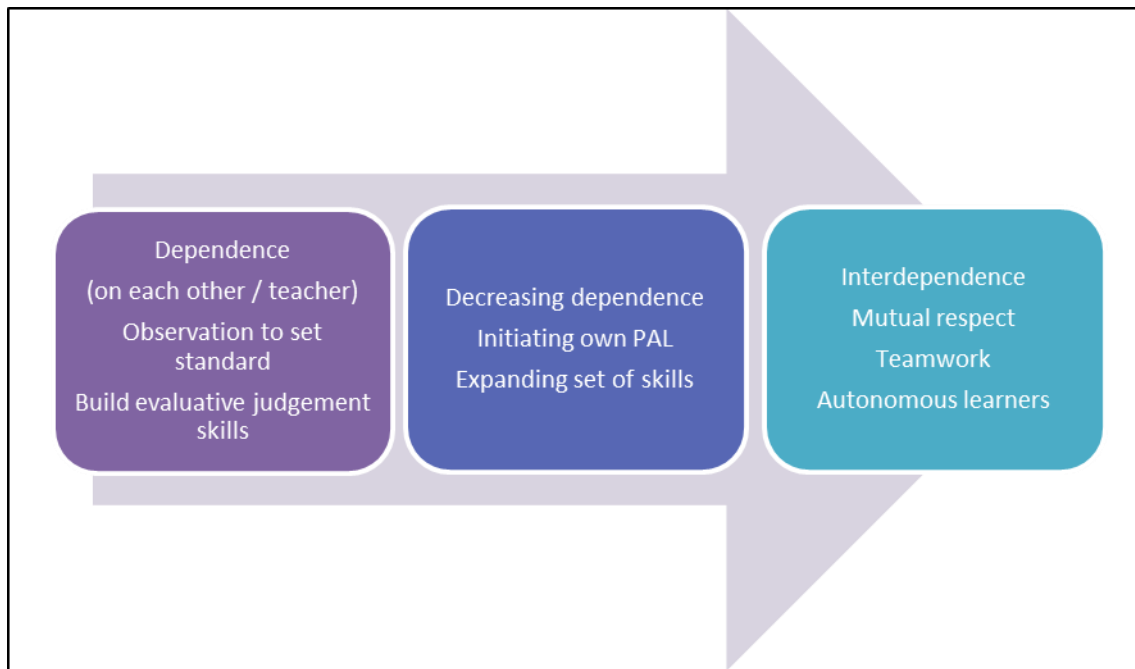


Figure 7. 1 Continuum of PAL activity in the clinical setting

This pattern of engagement is more likely to encourage students to develop life-long skills in seeking and utilising PAL to enhance performance, and to reduce the burden on educators to ‘mandate’ PAL activities. Learning with peers has been shown to encourage development of critical evaluation of self and others, or ‘evaluation judgement’ skills (Tai et al., 2016), likely to be important for self-regulated practice. Structured sessions may reduce over the course of the placement, as students become more independent in their practice. See Box 7.2 for suggested activities and prompts for students to promote autonomy in initiating peer assisted learning.

Activity	Key prompts for students	Examples
Orientation	What are the ground rules? What do I need to be familiar with? Who are the people I need to know? Who will be my team? What PAL opportunities have I been involved in in the past that I could apply here?	Confidentiality Safe learning environment Respecting others opinions Punctuality Translating teaching and learning skills to the clinical setting
Observation	Of educators: What is the benchmark standard? Or what does good practice look like? Of peers: What was done well? What could be improved?	Taking a patient history Conducting a patient assessment Performing a procedural skill Closing a consultation Breaking bad news Obtaining informed consent
Information	What information do I need? What information could add further value to the care of the patient?	Summarising a patient's history Researching a diagnosis Assessing the evidence for an intervention Discussing the case with other health professionals in the team
Collaboration	What knowledge or skills can I offer? What can others help me with? Where are the gaps in my knowledge and performance? What are my strengths in the team? What do I need to work on?	Presenting a case Completing a group project Drafting a procedure or guideline Conducting a group audit Arranging a peer observation and feedback session Role playing Dividing topics amongst peers and tutoring one another Teaching a clinical skill to a peer Asking a peer to demonstrate a clinical skill Discussing/presenting cases seen individually
Reflection	What went well today? What could be improved? Where do I need to focus my learning? How am I performing compared to the expected standard? How well are we working together as peers? What could be improved?	Debriefing with peers Brainstorming ideas to improve knowledge and performance Planning for the next day/week: timetable, activities, CPAL Assessing (formative) self and/or peers against performance criteria Discussing the peer relationship and any strategies required to optimise learning

Box 7. 2 suggested PAL activities and prompts for students

Do not forget observation of the expert educator

The direct observation and provision of feedback by peers does not necessarily mean students are ready to assess and treat patients independently. The example set by a clinical educator is still critically important in establishing the standards required and behaviour expected for each relevant clinical context (Billet, 2015). Direct observation of 'experts' provides a benchmark against which students can evaluate their own performance and the performance of others, which will then enable them to observe and provide feedback to each other more effectively.

Maintain individual student time

Students may demonstrate some resistance to PAL because they perceive it to 'take time away' from learning with an expert clinical educator (Sevenhuysen et al., 2014; Tai et al., 2014). Tasks conducted by individual students should still feature in PAL placement models and learning from individual tasks can be valuable content for debriefing and critical reflection (see Box 7.2). Clinical educators should ensure students receive individual (1:1) formal feedback in line with the education provider expectations.

Modify critical reflection (process and content)

Typically critical reflection is encouraged in clinical education after patient interactions. However in PAL models, students should be encouraged to also reflect on the peer learning process itself (see Box 7.2). This will allow time for students to discuss any challenges, or any interpersonal issues which may arise and to identify strategies to overcome them.

How to structure successful PAL activities

When we ask students to participate in a structured PAL activity, we are asking them to learn cooperatively. Effective co-operation (Johnson and Johnson, 1994) occurs when students:

- Perceive that they can achieve their personal goal while the peer group also achieves its goal (e.g. student A giving valuable feedback to student B may enhance student B's performance but also demonstrates student A's sound judgement skills).
- Must work together but each individually contribute to the overall process to be successful in completing the task (e.g. each student completing a component of a patient assessment, then coming together to formulate a diagnosis/treatment plan).

Clinical educators should ensure that for each activity, students are:

- Rewarded as a team but are assessed individually.
- Helping each other to achieve learning goals.
- Expected to improve based on their own previous performance.

How to encourage active engagement in peer observation, feedback and coaching

A large component of the collaborative learning which occurs in clinical education involves peer observation and feedback (Tai et al., 2014). Students may require information, structure and modelling to assist them in effectively observing peers and engaging in peer feedback. Educator-student feedback discussions can occur early in the placement with peers observing the process, on the condition that they are not sensitive in nature. For issues relating to professionalism or unsafe practice, clinical educators may elect to provide feedback on a 1:1 basis to provide a climate of trust to optimise the feedback (Carless, 2012). Observation of how educators facilitate feedback discussions provides students with a powerful learning opportunity to:

- Reflect on their own performance as it relates to what has been observed
- Reflect on their own evaluative judgement skills compared to those of the clinical educator
- Observe how an effective feedback discussion is structured
- Hear additional advice for improving performance which may be utilised in the future

In addition to learning through observation, it may be useful to provide students with frameworks and tools to help guide them in structuring their peer feedback sessions (see Box 7.3 for suggestions). Observation and feedback may also be guided by the key performance areas in a longitudinal clinical assessment (if they are used). To maximise the benefit, peer feedback discussions should include a coaching component, where peers formulate a plan for performance improvement together (Ladyshevsky, 2000).

Activity	Suggested framework/tool
Teaching a peer a clinical skill	'Advanced Trauma Life Support' five-step method for teaching psychomotor skills
Providing feedback to a peer based on an observed performance	The 'Pendleton model of feedback'
Assessing a peer	Key performance areas in a longitudinal clinical assessment (if they are used)
Presenting a case to a peer	The 'SNAPPS model' (summarize, narrow, analyse, probe, plan, select)
Critically analysing risk with a peer	The 'complexity-risk matrix'
Reflecting on performance	Gibbs reflective practice cycle

Box 7. 3 suggested frameworks for students to guide PAL (Sevenhuysen et al., 2014)

Motivate

Motivating students to positively engage in PAL can occur at the time of orientation, during assessment procedures and when students are given the opportunity to contribute to improvement processes.

Orientation

An explicit orientation to PAL in addition to the usual health service orientation is a crucial component of a successful PAL placement to motivate the students towards participation (see Box 7.4). The students and clinical educator should set clear expectations of how the placement will work and how students will be expected to engage in peer assisted learning. Students should be provided with information on the benefits of PAL for them both as learners and future health professionals. This is ideally afforded by the education provider in the pre-clinical preparation phase and can then be reinforced by the clinical educator on placement.

<p>Students' previous experience with PAL and how this can be translated to the clinical setting</p> <p>Benefits of PAL for students (based on the PAL research in health professions education)</p> <p>How PAL tasks will be structured</p> <p>How often PAL tasks will be timetabled</p> <p>Who will initiate activities being added to the timetable</p> <p>How the timetable may change throughout the placement</p> <p>How PAL will contribute to the assessment of students on placement</p> <p>Discussion of feedback with peers observing</p> <p>Professional behaviour within the peer relationship – confidentiality, respect, honesty</p>
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Box 7. 4 Orientation to PAL purpose and process

Understand the assessment criteria

Clinical educators should consciously consider how PAL interactions between students will be monitored and evaluated, as the clinical assessment can be an important motivation for students. Unless PAL activities have been mandated by the education provider, it is likely that PAL will be formative in nature. However, PAL interactions can contribute to parts of the summative clinical assessment, under items such as teamwork and professional behaviour (if used).

Manage risk

Student compatibility and competition is frequently raised as a concern by clinical educators considering PAL, but it is rarely observed in practice (Sevenhuysen et al., 2015). Educators can play a key role in creating an environment where collaboration is encouraged and competition is minimised, by setting up tasks as outlined in this guide. However, there may still be occasions where sub-optimal peer relationships occur and these need to be managed sensitively.

Continuously evaluate and modify PAL techniques being employed

As with any learning strategy, it is important to continuously monitor the effectiveness of PAL throughout the placement and make modifications to the programme to cater for learners'

individual characteristics, skills and preferences. Educators may use observations of performance, student reports, feedback from other staff members, educator and student reflections, reviews of written feedback, and other evaluation data sources to assess the effectiveness of the various PAL tasks, activities and processes.

On completion of the placement, students and educators should be encouraged to reflect on their experiences with PAL and consider what changes they will make for the future. Students are more likely to be motivated to contribute if they know their comments and experiences are noted and changes made where appropriate.

7.4 Summary

Descriptive and experimental studies suggest that PAL can be a potent learning strategy in health professional education. To implement PAL successfully in the clinical education environment, educators are encouraged to undertake additional planning and employ specific implementation strategies. Educators can generate sufficient capability for PAL by assessing and building on the students' and their own educational skills, particularly relating to identifying goals for performance, and observation, feedback and teaching skills. Educators can create opportunity for PAL to occur by timetabling specific activities, enabling student autonomy and structuring the environment and activities to maximise cooperation. Students may be motivated to engage in PAL by providing them with information on the benefits for them as learners and future health professionals, and how PAL can contribute to positive performance assessment. Introducing PAL does not require the educator to step away from their teaching responsibilities in the workplace, but rather asks them to work differently. The goal of PAL implementation is for students to reap benefits within placements, but also adopt collaborative skills and evaluative habits that hold them in good stead for their future health professional roles.

Chapter 8: Challenging assumptions on peer assisted learning in clinical education.

Preface

Through the experience of facilitating clinical educator workshops on PAL I began to understand more about how participants' assumptions and beliefs about clinical education can influence their supervision style. Many of these assumptions and beliefs are revealed through the questions asked in the workshops and are consistent with the feedback received throughout the three PAL studies contained within this thesis. These assumptions often go unchallenged and perpetuate within the clinical education discourse. This led to the development of the final paper within the research program, using the results from studies 2 and 3 to test assumptions identified by clinical educators. The results are presented in the following chapter which is adapted from an article currently under review by Sevenhuysen, S., Haines, T. & Molloy, E. (2016). Testing assumptions of peer assisted learning in clinical education. (*Advances in Health Sciences Education*).

8.1 Introduction

Peer assisted learning has been defined as 'to get knowledge through study, experience, observation or teaching of an equal' (Lincoln and McAllister, 1993). Peer assisted learning features as an educational intervention in most pre-clinical learning environments in the health professions (Bennett et al., 2015; Tai et al., 2014; Topping and Ehly 1998; Lincoln and McAllister, 1993). However, the implementation of PAL in clinical education has been less prevalent due to specific challenges of translating this approach into the complex and variable clinical setting (Bennett et al., 2015).

The potential benefits of PAL in clinical education as identified in the literature include improved learning opportunities, increased social support resulting in optimal student confidence levels, improved acquisition of problem solving, clinical reasoning, self-reflection and evaluation skills and a reduced dependence on the clinical educator (Ladyshevsky, 2002; Ladyshevsky, 2004; Sevenhuysen et al., 2016a; Tai et al., 2016; O'Connor et al, 2012; Secombe, 2008; Baldry-Currens, 2003). However, clear descriptions of the PAL approaches utilised and an indication of the frequency of these activities is often lacking in published literature. In particular, the role of clinical educators in PAL is not well described. Clinical educators are likely to influence the effect of PAL on student learning outcomes through creating an environment and allocating tasks that are conducive to collaborative learning (Boud, 1999; Lincoln and McAllister, 1993).

Challenges when using PAL in the clinical environment include the requirement for increased planning and organisation, caseload allocation and the management of peer relationships (Sevenhuysen et al., 2014; O'Connor et al, 2012; Baldry-Currens and Bithell, 2003). Previous studies have described these challenges after a PAL intervention has been tested, but only one study has reported preconceptions held by clinical educators prior to applying PAL models (Tiberius and Gaipman, 1985). Qualitative data pertaining to advantages and disadvantages of the 2:1 (student: educator) model were collected from clinical educators before and after participating in the model. However this study was conducted in a single allied health profession (Occupational Therapy) with a small number of participants (n=5) who were directed specifically to report on advantages and disadvantages. Further evidence is required to understand what the broader assumptions relating to PAL are, and if they are justified or misplaced. Understanding these potential biases, including how and why they were developed, may be important in considering how to successfully implement peer-based activities in clinical education.

This paper aims to:

1. Identify key assumptions of educators that may serve as barriers to PAL in clinical education practice, and
2. Test whether these conceptions are justified or misplaced.

This paper will therefore be presented in two stages, each stage addressing one aim.

8.2 Methods (stage 1)

8.2.1 Design

As part of a PAL research program to develop and test a PAL model of clinical education, four two-hour workshops were arranged to discuss PAL teaching and learning activities that would be feasible and acceptable in a typical student clinical placement (Sevenhuysen et al., 2013). It was hoped that this collaborative process would improve participants' confidence as facilitators of peer assisted learning.

8.2.2 Participants / setting

Clinical educators (physiotherapists who provided clinical education to physiotherapy students as part of usual duties) were eligible to participate in this project. The physiotherapy students were enrolled in programs that prepared them for entry to the profession on graduation. The health

network included five distinct hospital campuses, and community health and rehabilitation centres. The study protocol was approved by the health service and university human research ethics committees. Informed consent was obtained from all participants.

8.2.3 Data Collection

Participant discussion in the workshops was audiotaped and transcribed verbatim. Open text responses were collected on a participant written feedback form immediately after each workshop. Facilitator reflective debrief forms were completed by four research team members (WN, EM, SS, MF) following each workshop.

8.2.4 Analysis

Analysis of the workshop transcripts, participant written feedback and facilitator reflective debrief forms was based on Thematic Analysis techniques (Miles et al., 2014). Data specific to any assumptions, conceptions or concerns about PAL were extracted from all sources and coded independently by two members of the research team (SS and WN). An extended analysis framework was developed based on these triangulated codes, cross-checked against transcripts and written documents, circulated to researchers (TH, EM), discussed, and adjusted to reflect key themes in the data. Disagreements were negotiated through consensus (Bearman and Dawson, 2013). The results were reported back to participants for further validation. No changes were made as a result of this member checking cycle.

8.3 Results (stage 1)

8.3.1 Demographics

Workshops were open for any physiotherapy clinical educators to attend, and attendance at all four workshops was not compulsory. Therefore, a range of participants (12-17) attended each workshop. Attendance was recorded in a de-identified manner so a total number of participants across the four workshops was not able to be calculated (many participants attended multiple workshops). Fourteen participants chose to provide their demographics via an online survey and the results are presented in table 8.1. The majority were aged 25-30 years and most had less than three years' experience as a clinical educator (table 8.1).

Demographic	Range	n	%
Age	20-25	4	29%
	25-30	8	57%
	30-35	1	7%
	35-40	0	0%
	40-45	1	7%
	Total	14	100%
Years of experience in clinical practice	< 1	0	0%
	1-3	5	36%
	3-5	5	36%
	5-10	3	21%
	> 10	1	7%
	Total	14	100%
Years of experience in clinical education	< 1	3	22%
	1-3	7	50%
	3-5	2	14%
	5-10	2	14%
	> 10	0	0%
	Total	14	100%
Confidence in clinical education	Not confident	0	0%
	Neutral	6	42%
	Somewhat confident	4	29%
	Confident	3	22%
	Very confident	1	7%
	Total	14	100%
Number of workshops attended	0	0	0%
	1	8	58%
	2	2	14%
	3	2	14%
	4	2	14%
	Total	14	100%

Table 8. 1 Clinical educator demographics (stage 1)

8.3.2 Qualitative Analysis

Five key concerns relating to PAL in clinical education emerged from workshop participants. The concerns were centred on students, patients and clinical educators. Participants also perceived that factors affecting student learning and educator burden could negatively impact on patient care. Themes identified are bolded within the text and summarised in figure 8.1.

Sub-optimal peer relationships and their effect on both student outcomes (satisfaction and learning) and educator outcomes (satisfaction and workload) were of concern to many workshop participants.

“What if you get two students who are a different mix [of skill levels] or demonstrate different knowledge? What if there are different learning styles, it's hard to teach?”
(educator, PAL workshop)

“What about if you have a student who comes off from the other student as not being so good... and you don't know who did what, but really one student is doing everything, the other isn't” (educator, PAL workshop)

“Several of the clinicians voiced their concern about the disadvantage to a high achieving/performing student within the PAL pair due to the absorption of energy required by a poorly performing student” (facilitator reflections, on PAL workshop)

Clinical educators expressed concern that students spending more time working together would result in a **reduced ability to perform independently of their peer**.

“The whole goal is independent practice...my concern would be that [spending time with peers] has an influence on their marks. I don't think I would feel comfortable with that”
(educator, PAL workshop)

“Does ‘sticking with a peer’ mean that the learner is inclined to hold tight to the ‘student role’ rather than a ‘novice practitioner’ role?” (facilitator, reflections on PAL workshop)

Participants reported that facilitating PAL tasks such as observation and reflection had the potential to **reduce students’ exposure to ‘hands on’ patient experiences**. This concern was also raised in relation to clinical educators sharing their workload between multiple students, and students having to share the care of particular patients. There was a perception amongst clinical educators that

reduced 'hands on' experiences with patients would impact negatively on student learning outcomes.

"Today reinforced to me that there is a prevailing attitude [from clinical educators] that people learn best through doing, rather than watching and analysing" (facilitator, reflections on PAL workshop)

"You do learn from observing but I feel like the idea of placement is more to get hands on experience" (educator, PAL workshop)

Clinical educators were apprehensive about the **accuracy of the information or instruction that is shared between peers** and the effect this could have on students' learning outcomes. Concerns were raised about the potential effect that inaccurate knowledge may have on student and patient safety. Clinical educators were also apprehensive about the ability of peers to provide accurate and high quality feedback to each other and the effect this might have on student learning outcomes.

"How do you trust the students to follow your instructions? Need to know their ability" (educator, PAL workshop)

"You can't necessarily control what they do in that study time" (educator, PAL workshop)

"I think the first half [of feedback] can be done with peers but when it comes to mature thinking and decision making you need formal supervisor feedback" (educator, PAL workshop)

"Concern re: patient safety using a PAL model" (educator, written feedback post workshop)

Participants reported feeling worried about the **increased administration, organisation and workload** involved with managing multiple students.

"It is twice the amount of paperwork" (educator, PAL workshop)

"There's going to need to be a lot of preparation and I'm going to have to be really organised" (educator, PAL workshop)

"Potentially time-consuming" (educator, written feedback post workshop)

Summary of key themes relating to aim 1

Workshop participants perceived that student involvement in PAL had the potential to negatively affect outcomes for students and clinical educators, and that this in turn had the potential to adversely affect patient outcomes (see Figure 8.1). Key concerns included that student involvement in PAL would result in: peer relationships which are difficult to manage, a reduction in the students' ability to perform independently, a limitation to students' exposure to 'hands on' patient experiences, inferior quality of information being shared between students compared with information imparted by the clinical educator and increased clinical educator workload.

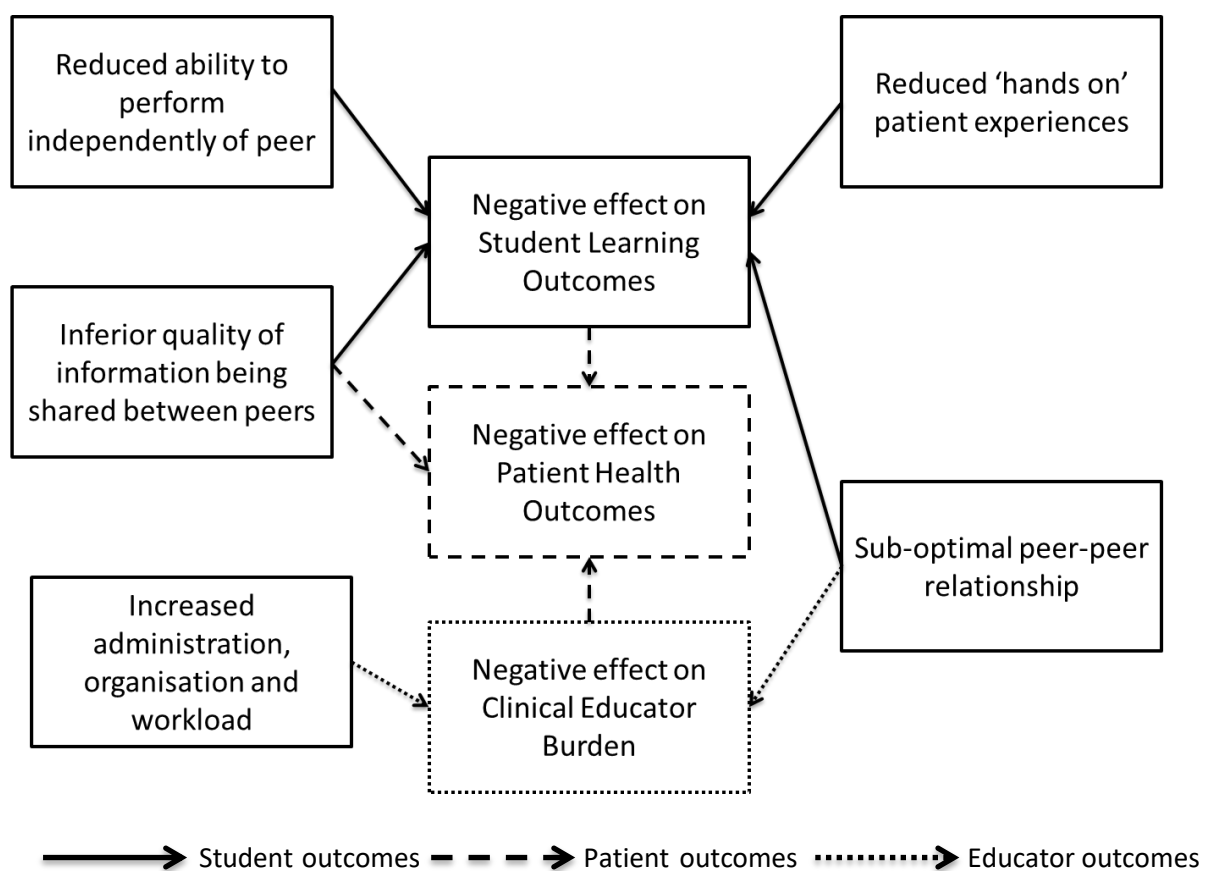


Figure 8. 1 Concerns regarding the implementation of PAL in clinical education

Stage 2 of this paper tests whether these concerns are supported by evidence. The experimental study data were collected as a part of a broader research program (Sevenhuysen et al., 2014; Sevenhuysen et al., 2015; Sevenhuysen et al., 2016b). The data collection approaches were included prospectively, informed by the assumptions identified in stage 1. For example, the key concerns or

hypotheses raised by clinical educators in stage 1 were incorporated into interview questions for both educators and students, along with collection of educator workload data, student performance outcomes etc.).

8.4 Methods (stage 2)

8.4.1 Design

The assumptions were tested via a secondary analysis of data collected during two previously published trials:

Trial 1: Physiotherapy randomised controlled trial (Sevenhuysen et al., 2014; Sevenhuysen et al., 2015)

This study compared two models of physiotherapy clinical education: a traditional paired student model and a PAL paired student model (Sevenhuysen et al. 2013). Quantitative data including student performance outcomes, clinical educator workload statistics and student activity records were collected at the end of each placement block. Qualitative data were collected via focus groups that were conducted at the end of the project period.

Trial 2: Multidisciplinary controlled trial (Sevenhuysen et al., 2016b)

This study used a stepped wedge design (Brown and Lilford, 2006) to investigate the effect of providing education in PAL to clinical educators. Quantitative data collected across the project periods allowed analysis of the student activity before and after their clinical educator had been exposed to the education. Qualitative data were collected via focus groups that were conducted at the end of the project period.

8.4.2 Participants / setting

Both trials were conducted in the same tertiary metropolitan health service as in stage 1. Participating sites included five hospitals, four community health and rehabilitation centres and two inpatient mental health facilities. Allied health clinical educators (clinicians with student supervision responsibilities as part of their clinical role) were invited to participate if they had no previous formal education in PAL, were available to supervise student pairs during the study period and were able to attend the relevant workshops. Students were invited to participate if they were completing a clinical placement as part of an entry-level program and were being supervised in a pair by eligible clinical educators enrolled in the study. The study protocols were approved by the health service and university human research ethics committees. Informed consent was obtained from all participants.

8.4.3 Measurements

The outcomes measured used and their relationship to the assumptions identified in stage 1 are presented in Table 8.2.

Assumption (stage 1)	Outcome Measure (stage 2)	Study collected in
Negative effect on student learning outcomes	Student performance - Assessment of Physiotherapy Practice (APP)	Trial 1
	Student and clinical educator perceptions - focus groups and surveys	Trials 1 & 2
Negative effect on clinical educator burden	Clinical educator workload statistics	Trial 1
	Student and clinical educator perceptions - focus groups and surveys	Trials 1 & 2
Negative effect on patient health outcomes	Incidents reported through electronic risk management system	Trials 1 & 2
Reduced ability to perform independently of peer	Student activity record statistics	Trials 1 & 2
Reduced 'hands on' patient experiences	Student activity record statistics	Trials 1 & 2
Sub-optimal peer-peer relationship	Student and clinical educator perceptions - focus groups and surveys	Trials 1 & 2
Inferior quality of information being shared between peers	Student and clinical educator perceptions - focus groups and surveys	Trials 1 & 2
Increased administration, organisation and workload	Clinical educator workload statistics	Trial 1
	Student and clinical educator perceptions - focus groups and surveys	Trials 1 & 2

Table 8. 2 outcome measures used and relationship to assumptions

Measure of student performance

Student performance was measured in trial 1 using the Assessment of Physiotherapy Practice (APP), scored by blinded outcome assessors, supervising clinical educators, and students at the end of each 5-week placement. The APP instrument is designed to monitor longitudinal evaluation of physiotherapy student performance in the clinical environment and has been shown to be reliable with an ICC (2,1) of 0.92 (95% CI 0.84 to 0.96) (Dalton et al., 2012) and has been validated against a range of indicators (Dalton et al., 2011). The total APP score ranges from 0 to 80, with a higher score representing better performance.

Student activity record statistics

In both trials, students recorded a range of learning activity statistics, including number of times treating patients, observing, providing peer feedback, and engaging in facilitated peer learning activities. Learning activity statistics were recorded on a daily basis, using a form created by educator workshop participants during the model development (Sevenhuysen et al., 2013).

Clinical educator workload statistics

Clinical educators recorded a range of workplace statistics in trial 1, including number of patients seen, time spent on administrative tasks, direct teaching, student supervision, and quality assurance activities. Educator workload statistics were recorded at the end of each day on a form generated during the model development phase (Sevenhuysen et al., 2013).

Student and clinical educator perceptions

In both trials, qualitative data about the clinical educator and student clinical education experience was collected via surveys and focus groups on completion of the data collection period.

Reported incidents

In both trials, the number of incidents involving students and/or patients of students was recorded during the study period using the health service electronic risk reporting system.

8.4.4 Analysis

Quantitative data analysis was conducted using STATA IC version 13. The student performance measure collected in trial 1 was compared between groups using linear regression analysis. As this was a cross-over trial, data were clustered by participant and robust variance estimates were calculated to account for this data dependency. The overall between-group result was not adjusted for student characteristics as student participants contributed equally to both groups.

The number of student learning activities (trials 1 and 2) and educator workload statistics (trial 1) were added across the 5-week placement and divided by the number days present to yield an average number of occurrences per day for each category. The between-group difference was analysed using a linear mixed model regression.

The qualitative data were coded independently by two research team members (trial 1: SS, MF; trial 2: SS, JT) using thematic analysis (Miles et al., 2014) to distil key themes. Disagreements were

negotiated through consensus, thus adding rigour to the analysis process (Bearman and Dawson, 2013). The results were reported back to participants for further validation. An extended analysis framework was developed based on these triangulated codes, cross-checked against transcripts, circulated to researchers (TH, EM, SS), discussed, and adjusted to reflect key themes in the data.

8.5 Results (stage 2)

8.5.1 Participants

A summary of the clinical educator and student participant numbers for both trials is presented in Table 8.3. A total of 44 clinical educators and 69 students participated across two trials.

Trial 1: The blinded assessors (n=6) measuring student performance had more than five years of experience in clinical practice and in clinical education. They had current or recent experience with physiotherapy students, either teaching on-campus and/or as a clinical educator. The clinical educators (n=14) measuring student performance and entering daily statistics were mostly aged between 20 and 30 years with a Bachelor level qualification. Their time in clinical practice and in clinical education ranged from <1 to 10 years. Twelve of these clinical educators participated in focus groups. Students (n = 24) completing daily activity records were mostly aged between 18 and 25 years and two-thirds had completed two years of tertiary education prior to clinical placements. Twenty-two of these students participated in focus groups.

Trial 2: The clinical educators (n=30) were from seven allied health professions and mostly aged between 26 and 35 years with a Bachelor level qualification. Their time in clinical practice and in clinical education ranged from <1 to 10 years. Fourteen of these clinical educators participated in focus groups. Students (n=45) completing daily activity records were mostly in their second-last or final year of clinical placements. Thirty-six of these students participated in focus groups.

Data source and type	Clinical educators	Students
Trial 1 quantitative data	14 Physiotherapists	24 Physiotherapy
Trial 1 focus groups	12 Physiotherapists	22 Physiotherapy
Trial 2 quantitative data	8 Social Workers, 7 Occupational Therapists, 4 Physiotherapists, 4 Podiatrists, 3 Music Therapists, 3 Dietitians, 1 Exercise Physiologist.	7 Social Work, 11 Occupational Therapy, 11 Physiotherapy, 2 Podiatry, 4 Music Therapy, 8 Dietetics, 2 Exercise Physiology.
Trial 2 focus groups	5 Social Workers, 2 Occupational Therapists, 2 Physiotherapists, 1 Podiatrist, 3 Music Therapists, 1 Exercise Physiologist.	5 Social Work, 8 Occupational Therapy, 10 Physiotherapy, 2 Podiatry, 2 Music Therapy, 7 Dietetics, 2 Exercise Physiology.

Table 8. 3 Summary of participants (stage 2)

Negative effect on student learning outcomes

Student performance outcomes were measured in trial 1. There were no significant differences in the APP scores between the PAL and traditional models, whether awarded by the blinded assessor, the supervising clinical educator or the students (Figure 8.2).

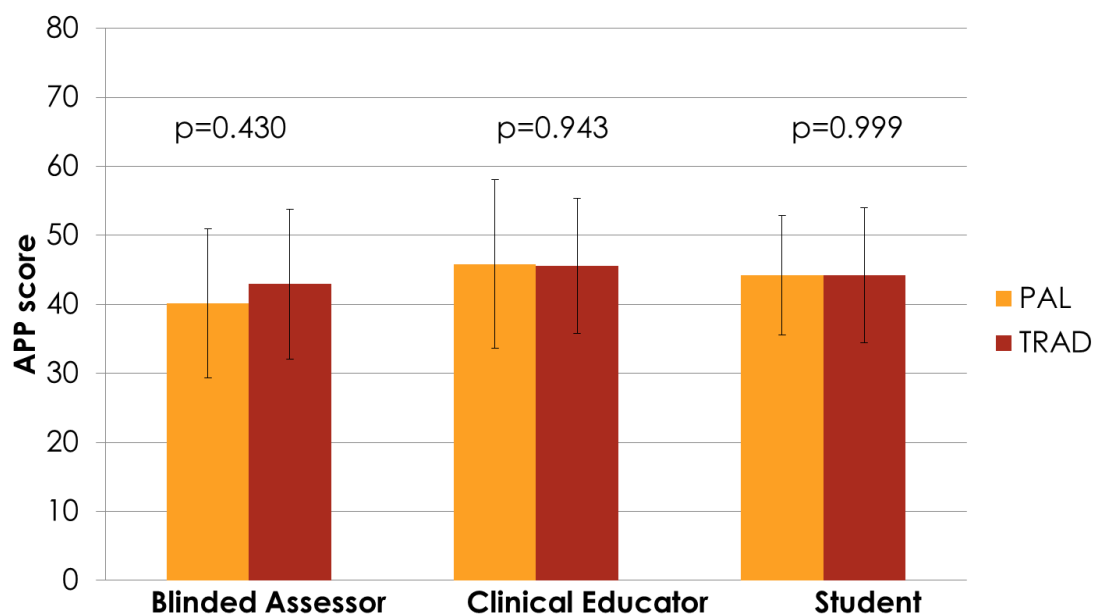


Figure 8. 2 Student performance outcomes, peer-assisted vs tradition model.

Only one student reported an instance where they received conflicting knowledge, feedback or advice from the supervisor and peer, which did not adversely alter the outcome of the placement. One student sought assistance from the University unit coordinator over the duration of the study. The student was participating in the traditional model at the time of the request for assistance.

A theme emerged from the qualitative data in both trials where students and clinical educators perceived that PAL had a positive impact on student learning. In trial 1, participants reported that PAL helped to: reduce anxiety, create a safe learning environment, maximise use of 'downtime', develop collaborative skills and increase feedback capability.

There were a few things that my partner and I went in and saw that were full-on. We got to debrief and talk about it; it was really casual and made us feel better. I think that was a huge benefit (Student, trial 1).

We would have a bit of time before my patient, and I would practice some assessment testing on [my peer]. He was there and happy to help and he would practice on me, it was good. You can't do that with your supervisor (student, trial 1).

They definitely learnt more about feedback and the importance of feedback... and maybe realising how difficult it can be for supervisors to do that side of things (educator, trial 1).

There were 152/460 (33%) comments coded in trial 2 pertained to the theme "PAL enhanced the learning environment". A further 118 (26%) comments were linked to the theme "PAL developed skills" for both students (collaboration, feedback and reflective practice) and clinical educators (learning facilitation skills).

It's been good bouncing ideas off each other especially asking 'not so intelligent' questions to someone that's not judging you or marking you. We have had feedback sessions on what we've done well and not so well. That's nice especially at the start to help you do tasks with someone you're comfortable with, you can work together, it makes it less stressful (student, trial 2).

You become more confident in giving feedback and become more skilful (student, trial 2).

In a hospital setting you have to work in a team and with other people, which is really important with PAL, and very important with day-to-day work (educator, trial 2).

Negative effect on clinical educator burden

Clinical educator workload statistics were measured in trial 1. Although there were some minor changes in the composition of the clinical educators day in the PAL model compared with the traditional model (see Table 8.4), there was no difference in the total time spent in patient related activity, the number of patients treated or the overtime worked.

Workload statistic	PAL	Trad	Linear mixed model coefficient (95% CI)	<i>p</i>
Time spent on tasks (min/day), mean (SD)				
direct student supervision	75 (37)	79 (48)	-3 (-15 to 9)	0.640
student related administration tasks	19 (13)	15 (19)	2 (-2 to 7)	0.314
direct teaching	11 (12)	12 (15)	-4 (-7 to 0)	0.040
student assessment	14 (19)	13 (17)	0 (-5 to 5)	0.997
student feedback	21 (13)	19 (15)	3 (-1 to 7)	0.112
non-student related administration tasks	79 (59)	75 (55)	6 (-6 to 17)	0.306
non-student related quality assurance tasks	11 (18)	5 (11)	5 (1 to 10)	0.020
patient attributable activity	215 (77)	213 (104)	-5 (-28 to 18)	0.661
overtime	9 (10)	8 (10)	3 (0 to 5)	0.077
Combined caseload of educator and students (patients/day), mean (SD)	8 (3)	9 (3)	0 (-1 to 0)	0.240

Table 8. 4 Clinical educator workload statistics

In both trials, clinical educators reported that PAL reduced educator burden and additionally in trial 2, participants reported that PAL increased productivity.

The PAL time is a well needed break from the questions and the real need they have for contact with you all the time (educator, trial 2).

I haven't noticed much difference between having one student to two students... apart from writing their evaluation; I sort of haven't felt that I have extra work from that point of view. Again having those advantages of having them together probably made my job a little easier (educator, trial 1).

The students worked effectively together in pairs as well as both taking on individual caseloads by end of placement (educator, trial 2).

Negative effect on patient health outcomes

There were no patient incidents reported involving students or patients being treated by students during the study period in either trial. This conception did not feature as a code or theme in focus group data.

Reduced ability to perform independently of peer

When using a PAL model, students did spend more time working with their peer (see table 8.5). In trial 1, students spent more time observing their peers perform a full patient assessment and treatment, received more written feedback from their peer, and received more verbal feedback with their peer present in the PAL model compared with the traditional model. Despite this, there were no differences in the activities that students undertook independently of their peer, including clinician observation, working without observation, receiving individual feedback, time observed by the educator, administration and statistics.

In trial 2, students spent twice as much time observing their peers perform an assessment after their clinical educator had attended the PAL education session, compared with their traditional practice prior to attending the PAL education session. Contrary to trial 1, there was a difference in the activities that students undertook independently of their peer. Students were 40% less likely to work with patients independently (without clinical educator or peer) and 34% less likely to be observed by their clinical educator when performing a treatment.

There were no comments related to this assumption in the qualitative data.

Activity	TRIAL 1				TRIAL 2			
	PAL	Trad	Linear mixed model coefficient (95% CI)	p	Before training	After training	IRR (95% CI)	p
	Mean (SD)				Mean (SD)			
Student received oral feedback - without peer present	0.61 (0.76)	1.05 (0.96)	0.45 (−0.04 to 0.93)	0.07	3.00 (4.09)	3.48 (3.08)	1.47 (0.94-2.29)	0.09
Student received oral feedback - with peer present	0.68 (0.53)	0.31 (0.41)	−0.37 (−0.63 to −0.10)	0.01	2.32 (3.14)	2.34 (3.02)	1.09 (0.63-1.88)	0.76
Student received written feedback from educator	0.51 (0.45)	0.20 (0.47)	−0.33 (−0.61 to −0.06)	0.02	1.57 (8.65)	0.78 (1.29)	0.54 (0.25-1.17)	0.12
Student received written feedback from peer	0.37 (0.29)	0.00 (0.00)	−0.36 −0.48 to −0.25)	0.00	0.28 (0.77)	0.40 (0.86)	2.08 (0.72-5.95)	0.17
Student received feedback related to placement assessment - without peer present	0.10 (0.12)	0.10 (0.12)	−0.01 (−0.05 to 0.04)	0.81	0.83 (1.29)	0.81 (1.23)	0.78 (0.42-1.44)	0.43
Educator observed student performing an assessment	0.77 (0.72)	1.27 (1.23)	0.51 (−0.00 to 1.03)	0.05	2.14 (3.15)	1.92 (2.73)	1.16 (0.81-1.68)	0.41
Educator observed student performing a treatment	0.93 (0.85)	1.40 (1.46)	0.47 (−0.13 to 1.07)	0.12	4.19 (5.59)	1.59 (2.96)	0.66 (0.46-0.94)	0.02
Educator observed student performing a full assessment and treatment	0.41 (0.47)	0.63 (0.74)	0.23 (−0.10 to 0.56)	0.17	1.06 (2.22)	0.57 (1.39)	0.81 (0.44-1.50)	0.50
Educator observed student pair with a patient	0.09 (0.21)	0.20 (0.34)	0.11 (−0.04 to 0.26)	0.15	1.95 (4.46)	0.90 (1.73)	1.03 (0.57-1.84)	0.93
Student observed peer performing an assessment	0.49 (0.43)	0.34 (0.47)	−0.16 (−0.38 to 0.07)	0.18	1.04 (1.76)	2.04 (1.50)	1.99 (1.22-3.25)	0.01
Student observed peer performing a treatment	0.46 (0.46)	0.26 (0.39)	−0.20 (−0.40 to 0.00)	0.06	1.33 (2.17)	0.58 (1.24)	0.95 (0.46-1.94)	0.89
Student observed peer performing a full assessment and treatment	0.27 (0.34)	0.11 (0.23)	−0.15 (−0.29 to −0.02)	0.03	0.44 (1.29)	0.19 (0.59)	0.43 (0.09-2.13)	0.30
Student worked with patient independently (without clinician or peer)	1.40 (1.52)	2.01 (1.51)	0.63 (−0.25 to 1.50)	0.16	6.33 (7.61)	4.88 (4.99)	0.6 (0.39-0.91)	0.02
Student worked with patient and peer (without direct clinician observation)	0.99 (1.41)	0.39 (0.82)	−0.58 (−1.36 to 0.19)	0.14	2.39 (5.42)	1.23 (1.98)	0.76 (0.32-1.79)	0.53
Student worked on patient related preparation/admin	0.36 (1.31)	0.23 (1.13)	−0.12 (−0.94 to 0.70)	0.78	7.48 (7.52)	8.28 (6.15)	0.97 (0.69-1.35)	0.84
Student worked on non-patient related tasks independently	1.82 (1.64)	1.19 (1.59)	−0.64 (−1.59 to 0.32)	0.19	2.01 (2.90)	4.11 (2.88)	0.81 (0.52-1.26)	0.36
Number of patients seen	8 (3)	9 (3)	0 (−1 to 0)	0.24	18 (16)	14 (10)	1 (0.8-1.3)	0.72

Table 8. 5 student activity

Reduced hands on patient experiences

Students did not treat significantly less patients when using a PAL model compared to a traditional model in either trial (see table 8.5). The perception that PAL could not replace “hands on learning experiences” arose as a theme in trial 1 (from both students and educators) but did not feature as a code or theme in trial 2.

I figure I am going to learn more treating a patient than watching someone else treat a patient (student, trial 1).

You do learn from observing but I feel like the idea of placement is more to get hands on experience (student, trial 1).

I just thought they were both frustrated in how long it was taking observing. They felt they got more out of it if they were treating the patients themselves (educator, trial 1).

Sub-optimal peer-peer relationships

A theme emerged in the data from both trials where students and clinical educators perceived that the cohesion of the student relationship could impact on the success of PAL.

I think it depended on the student largely, that's a comment I have in general. It really depends on which student you had. Some students were really good, took a lot of initiative and we didn't have to ask a lot of questions at all, we had others that needed more prompting (educator, trial 1)

If you're not naturally the right fit it could be a bit of a struggle I think (student, trial 2)

Clinical educators reported that managing students of variable performance levels was a challenge.

If the students are at different levels and they required individual supervision on something specific, that took a lot of time (educator, trial 2)

Despite this, clinical educators also reported positive experiences of student differences. No destructive peer relationships were reported in either trial.

We've noticed since they've been on placement together their relationship is working in a positive manner with their differences coming together to support each other (educator, trial 2).

I was told possibly my students didn't get along all that well outside of the clinical placement but I didn't see that reflected when I supervised them... if that was the case they were both very professional (educator, trial 1).

Clinical educators considered that students' ability to interact productively with peers was representative of authentic practice and could be seen as a marker of their capability for the workforce.

We [clinicians] come down and discuss probably 70% of our cases in the department because you're always looking for somebody else's advice or something like that. You've heard that feedback from the person who hasn't even seen the patient, but has obviously gotten something out of it (educator, trial 2).

It's [PAL] reflective of real life, you're always going to be working with people that are less experienced or bring different things to the table. You need to be able to act accordingly, it's part of your professionalism (educator, trial 1).

Inferior quality of information being shared between peers

Concerns about the quality of clinical information being taught by peers did not feature as a code or theme in the data. However in trial 1, in relation to performance information, both students and clinical educators reported placing higher value on clinical educator feedback over peer feedback.

It just seemed it was more in depth and I felt it was more relevant. It might have been that I respect the opinion of the clinician. Not that I don't of my peer but you respect your clinician a lot more because they have the experience and really know what they're talking about (student, trial 1).

You want to know you're doing well from your supervisor because they're the ones that are going to give you the [marks]. Maybe not take notice as much if it's from a peer (educator, trial 1).

In trial 1, some participants perceived that peer feedback could lack depth, because students lacked the clinical experience needed to prioritise deficits in observed peer performance. This did not feature as a code or theme in trial 2.

I noticed the type of things they were commenting on were quite superficial. Like, "you didn't introduce yourself well to the patient" or something like that. Whereas I was thinking "you

didn't check the [patient observations] and the blood pressure is low, the patient is going to fall over when you get them out of bed” (educator, trial 1).

I had trouble in going into the detail the supervisor was giving. The feedback the supervisor was giving was more in depth because they know what they're doing (student, trial 1).

Increased administration, organisation and workload

There was no difference in the time spent by clinical educators on administration when using a PAL model compared to the traditional model (see table 8.4). The perception that PAL could not replace “observing the practice of the clinical educator”, “individualised feedback from the clinical educator” and “expert guidance” arose as themes in trial 1, inferring the need for clinical educators to plan ahead and organise for these components to be incorporated in PAL placements. In trial 2, 91/460 (20%) comments coded pertained to the theme “PAL requires additional skills and preparation” for the clinical educator in order for PAL to be successful, implying that some changes in organisation and workload distribution is required.

The initial period is time consuming especially we've got a lot of students... planning for PAL we had a lot of meetings with all the supervisors to establish how to run the program (educator, trial 1).

In the beginning, you have to invest a lot of time. It wasn't just me going and doing an intervention or assessment with a patient, it was then having a discussion with them together and I was doing one-on-one as well. At the beginning, there was a lot of one-on-one with them plus the PAL stuff going on at the same time (educator, trial 2).

The supervisor has to set the ground rules. Seeing patients knowing that this person is taking the lead or this one is taking the lead or I will start and then you can take over. Not just going in there and tripping over and talking over each other (student, trial 1).

... being able to have that discussion about what the benefits of peer assisted learning are, how it's going to help you, what might be hard, before it even starts. Because I think if you don't get comfortable in being able to communicate that to your peer or supervisor before you start it might be hard to communicate that throughout the process (student, trial 2).

A summary of the results of part 2 and whether the assumptions identified in part 1 were challenged, supported or remain unresolved, is presented in Table 8.6.

Assumption (stage 1)	Results (stage 2)	Assumption supported or challenged?
Negative effect on student learning outcomes	No significant difference in student performance outcomes	Challenged
	PAL perceived to enhance the learning environment	
Negative effect on clinical educator burden	Minor changes in clinical educator workload statistics	Challenged
	PAL perceived to reduce clinical educator burden	
Negative effect on patient health outcomes	No incidents reported	Challenged
Reduced ability to perform independently of peer	Mixed results in student activity records No significant difference in student performance outcomes	Challenged
Reduced 'hands on' patient experiences	No significant difference in number of patients seen	Challenged
Sub-optimal peer-peer relationship can affect outcomes	Strong theme in qualitative data	Supported
Inferior quality of information being shared between peers	Absence of data in qualitative data	Challenged
Increased administration, organisation and workload	Minor changes in clinical educator workload statistics	Unresolved
	Theme in qualitative data re PAL requires planning and organisation	

Table 8. 6 results summary

8.6 Discussion

Workshop participants' perceptions (stage 1) that student involvement in PAL could negatively affect outcomes for patients, students and clinical educators were predominantly challenged by the data in stage 2. There was no evidence of PAL having negative effects on student learning outcomes, clinical educator burden or patient health outcomes. No evidence was found to support the preconception that students were less able to perform independently of their peers, were exposed to less patient interactions or shared poor quality information. Mixed results surrounding the administration and planning requirements of the clinical educator have rendered this assumption unresolved. There was support for the notion that the cohesion of the peer-peer relationship can influence outcomes.

It is important to challenge preconceptions because they can act as a barrier to individuals' ability to grasp new concepts, learn information taught and implement new strategies (Lucariello, 2014). If we

do not talk about and acknowledge fears/negative assumptions, or challenge assumptions held by educators in relation to PAL, there is likely to be resistance to uptake of PAL models in practice. It therefore seems important for those promoting and teaching PAL to recognise that these misconceptions exist, communicate these to participants and to include the contradicting evidence in continuing professional development workshops, guidelines and communication. Open discussion regarding concerns is a crucial component of any change process (Hewitt-Taylor, 2013) and should be encouraged prior to moving to implementation in health professions education.

The idea that PAL may negatively impact student learning has been challenged through studies both in the clinical environment and in education. In Hattie's (2008) meta-analyses, peers were shown to have a more positive influence on educational outcomes than simulation, testing, computers and many other learning approaches. Studies that have measured student performance in both the pre-clinical and clinical environment have concluded either similar or positive effects compared to traditional approaches (Moore et al., 2016; Bosse et al., 2010; Peets et al., 2009; Tolsgaard et al., 2007; Koles et al., 2005; Farrow et al., 2000; Nnodim, 1997; DeClute and Ladyshevsky, 1993). Perceptions that PAL enhances the learning environment are also well supported by previous reviews (Sevenhuysen et al., 2016a; Tai et al., 2016; O'Connor et al., 2012; Secombe, 2008; Baldry-Currens, 2003).

There were mixed results in the student activity records as to whether utilising PAL affects the amount of time students spend in independent learning activities. The variable results may be due to the conversion of "down-time" into PAL activities rather than simply replacing independent learning with PAL (Sevenhuysen et al., 2015). The total number of patients treated was similar in all models; however this may include patients treated together with a peer. Regardless of whether students participated in less independent learning or not, it did not affect their ability to perform independently of their peer when assessed.

The preconception that PAL would result in less "hands-on" learning was not supported by the quantitative results but the perception that PAL could not replace this form of experiential learning remained strong in the educator and student discourse. Experiential learning theory emphasises the importance of personal experience, however "hands-on" experience may not be the only mechanisms by which students can engage in experiential learning. A growing body of literature suggests that students are able to use another's experience to learn (Roberts, 2010). In both our trials, students spent more time observing their peers. In a recent systematic review investigating "hand-on" versus "observer" roles in simulation, five of seven studies demonstrated similar or better results in the observer group (O'Regan et al., 2016). There was an association between the use of

observer tools (such as checklists and templates) and both satisfaction and learning outcomes. Given that our results and those of others (Tai et al., 2014) indicate that observation is one of the predominant approaches used in PAL clinical education models, encouraging the use of observer tools to “hone judgement of performance compared to standards” (O’Regan et al., 2016; p.9) may enhance student learning. The role of the teacher is also said to be important in facilitating observational learning through the framing of questions and reflection after the activity, to promote meaning (Northedge, 2003). The high level ‘facilitatory skills’ needed by educators to make PAL work was a prominent theme emerging from educator and learner focus groups.

Our results indicated that PAL had minimal effect on measured aspects of educator burden. In the PAL model, there was less time spent in direct teaching, which is in line with a study in dietetics whereby the PAL model reduced the amount of clinical educator time spent in supervision per student hour while maintaining stakeholder satisfaction indicators (Roberts et al., 2009). Reports that PAL could actually reduce perceived educator burden are supported by previous reviews, however accounts to the contrary have also been reported (Sevenhuysen et al., 2016a; Tai et al., 2016; O’Connor et al, 2012; Secombe, 2008). The variability in the implementation of PAL within placement models may explain these mixed results. Although there was no difference in the administrative time required in any of the models, the qualitative data suggest that implementation of PAL models requires careful management and skill development. The results indicated that educators should consider planning prior to the placement, and that specific orientation and organisation of tasks (such as observation) early in the placement were key. Calls for educator and student education in PAL methods are often made in the literature to optimise the success of implementing PAL models and may also result in more consistent practice and outcomes.

The preconception that the success of PAL would rest on the compatibility of the peer relationship was supported by our qualitative data and has been reported in previous reviews (Sevenhuysen et al., 2016a; Tai et al., 2016; O’Connor et al, 2012; Secombe, 2008). As we did not prospectively gather data on the “cohesion” of the peer relationship, we are unable to draw conclusions on the effect of compatibility on performance outcomes. However, both students and educators reported that the peer relationship affected both the quality and the frequency of PAL occurring. Given that communication and working with others are key standards in every health profession, the potential for sub-optimal peer relationships does not seem a legitimate reason to avoid PAL models. This is further supported by the qualitative data linking students’ ability to participate in PAL with their overall fitness to practice and examples of situations where students were praised for their ability to “work through” their differences in a professional manner. In summary, while the data supports that

functional peer relationships are important to get right, there is also ample data to support that partnering with peers serves as an opportunity for students to develop important collaborative skills required for the workplace. Concern about peer compatibility should not be a reason to abandon PAL as an educational strategy.

Limitations

This study was conducted in the allied health professions, employing some different approaches to clinical education when compared with medicine and nursing. These structural and cultural differences between the professions may affect the applicability of the findings. For example, in medicine where student: educator ratios are historically larger, students may be the drivers of PAL whereas in the allied health professions the role of the clinical educator in facilitating PAL may be greater. This project was conducted in one health service, which limits generalisability, though engaging multiple allied health disciplines and hospital sites within the health service was a strength in design. Clinical educator participants were volunteers and therefore a self-selecting group. Issues may have been missed that related specifically to clinical educators who did not volunteer. For example, clinical educators who volunteered may have been particularly enthusiastic or motivated about their clinical education role or PAL.

Future directions

Further studies are required before a definitive rebuttal to educator concerns can be made. Notions about what constitutes peer cohesion/compatibility were variable in the data and more research is required to determine how students can be best prepared to function professionally within their peer group regardless of “compatibility”. Given that many of the benefits of PAL are reported in terms of developing students’ life-long skills such as communication, teamwork, teaching and evaluative judgement, a longitudinal study design is required to test whether these short-term benefits are sustained in the health workplace setting. In a study by Ladyshevsky (2002), simulated patients rated the communication skills and physical examination higher in the PAL group. Further investigation is needed from the patient perspective regarding the influence of PAL on quality of care provided by students.

8.7 Conclusion

PAL has a number of benefits for learners and educators in the healthcare setting. Despite promising results in studies over the last decade, the uptake of PAL in the clinical education setting has been less common than in other educational settings. It is important to identify conceptions held about PAL by clinical educators in order to address barriers to its use. Stage one of this study revealed that

clinical educators perceived student involvement in PAL would result in: peer relationships which are difficult to manage, a reduction in the students' ability to perform independently, a limitation to students' exposure to 'hands on' patient experiences, inferior quality of information being shared between students compared with what would be taught by the clinical educator and increased clinical educator workload. All these assumptions were refuted with the exception the administration and planning requirements of the clinical educator and the impact of the cohesion of the peer-peer relationship. We recommend that these assumptions and any others that may emerge from stakeholder engagement are openly discussed as part of any PAL education initiative.

Chapter 9: Discussion

This chapter summarizes and integrates the findings from this program of research. Implications and future research directions are also discussed. This program of research aimed to:

- Develop and test a PAL model of clinical education for paired, professional-entry level health professional students;
- Develop and test a training module for clinical educators to increase their confidence in supervising pairs of students and facilitating PAL;
- Examine the experiences of students and educators participating in paired student placements using PAL.

These aims were addressed by conducting three studies: the first study used a participatory approach to develop a PAL model of clinical education for paired, professional-entry level health professional students, the second study tested the effects of the model developed and finally, the third study tested the effects of the clinical educator training module developed. All three studies employed mixed methods approaches and studies two and three utilised experimental research designs. The experiences of students and clinical educators participating in paired student placements using PAL were examined in both study 2 and 3. The findings from these three studies were presented in chapters 3-6. Finally, the results from all three studies and the systematic literature review were combined with relevant educational theory to develop recommendations for practice (chapter 7) and challenge previously held conceptions about PAL by clinical educators (chapter 8).

9.1 Key findings

The findings from this program of research support the use of PAL as an educational strategy to enhance the learning environment across allied health professions in the clinical setting. Qualitative data from both the Physiotherapy RCT (study 2) and the multidisciplinary trial (study 3) were consistent in the cited advantages. Benefits reported by clinical educators included reduced educator burden, improved use of student 'downtime' and that PAL helped students to build professional skills such as teamwork, communication and feedback capabilities. Students reported that the psychological safety created by PAL enabled them to raise concerns about their own knowledge and practice, when compared to working with an expert other. Both students and educators gave examples of where PAL helped to position students as active learners through reduced dependence on the clinical educator.

The RCT (study 2) demonstrated that specific PAL activities can be integrated into the clinical education of paired students without sacrificing student performance outcomes. Although the quantitative data supported some positive outcomes under the PAL model, including clinical educators reducing time spent on direct teaching and increasing time available for quality assurance activities and students receiving more written feedback, both educators and students were more satisfied with the traditional approach. The rigidity of the prescribed model was cited as the major source of dissatisfaction. However, learners did report that the PAL model 'forced them' to play a more active role when observing practice and gave them deliberate practice in communicating evaluative judgments about peer performance. This clear finding informed the design of the multidisciplinary trial (study 3) where clinical educators and students were not required to adhere to a prescribed model with mandated frequency of activities, but instead were trained and supported to implement the elements of the PAL model flexibly.

The importance of clinical educator training in, and preparation for, PAL was highlighted by stakeholders and also features in the literature. When clinical educators were provided with training in PAL (study 3), their perceived confidence to facilitate PAL improved and there was a reported change in their education behaviours. This was supported by the student activity data, which demonstrated a statistically significant increase in the reported incidence of students undertaking observation of their clinical educator and their peer, and a reduction in independent work (without clinical educator or peer) with patients. Increases in the reported incidence of students undertaking observation of their peer were also demonstrated in the RCT. This may indicate that increasing the incidence of peer observation is one aspect of PAL which resonates with clinical educators.

Across the research program, clinical educators identified that facilitating PAL is a complex skill which takes education, resource and time to develop. Students supported this view and reported that while PAL may add to the clinical learning experience, it cannot replace skilled clinical educator practice modelling, feedback and guidance. Again the importance of skilled educators was highlighted to mitigate challenges associated with managing peer relationships and maintaining individualised feedback in the paired model. Cohesion of the student to student relationship was seen as an enabler of successful PAL, and there was also agreement that collaboration is a professional expectation.

This research has advanced knowledge in the area of PAL in the clinical setting as it is the first to compare two different approaches to paired student placements, rather than compare the 2:1 (student: educator) allocation model to the 1:1. The program has developed and tested a repeatable, quantifiable PAL model for the clinical education of paired students and refined this

based on empirical findings and stakeholder feedback to produce a flexible PAL framework to guide practice. This framework includes a clinical educator training module, a set of practical PAL activities for clinical educators to utilise flexibly in the clinical setting, principles to structure the environment to maximise collaboration between students and a range of concepts to support productive peer relationships.

9.2 Strengths and limitations of the research program

Clinical education practice in the allied health professions is lacking high quality, robust research evidence. This research program pioneered an approach that integrated stakeholder engagement in the design and implementation of two research designs (cross-over and stepped wedge randomised trials) that enabled development of robust evidence in a way that was acceptable in the clinical placement environment. This approach may be applicable in other areas of education or clinical practice. The approach and program design was strengthened by employing a mixed methods approach and triangulating data from multiple sources rather than relying on purely qualitative or purely quantitative measures.

This project was conducted in one health service with one group of clinical educators, which limits generalisability. Clinical educator participants were volunteers and therefore a self-selecting group. Issues may have been missed that related specifically to clinical educators who did not volunteer. For example, clinical educators who volunteered may have been particularly enthusiastic or motivated about their clinical education role or PAL. However, conducting the project within one health service enabled this innovative research design to be implemented reliably and without additional resources.

There was potential for response bias in the surveys, as participants may have built a relationship with the lead investigator through the research process. This may have had the effect of generating overly positive responses to questions asking participants to evaluate the PAL models employed. However this relationship between investigator and study participants was necessary as it assisted in facilitating participation and engagement in the research program and may have also contributed to the relatively high data collection and response rate and low drop-out rate. The structural and cultural differences within the allied health professions may affect the applicability of the findings to other areas. For example, in medicine where student: educator ratios are historically larger, students may be the drivers of PAL whereas in the allied health professions the role of the clinical educator in facilitating PAL may be greater.

9.3 Implications for practice

The findings of this research reinforce the view that a paired student clinical placement model can enhance clinical learning experiences for allied health professional students. A range of benefits were cited by student and clinical educator participants using this model, whether or not the specific 'PAL model' was employed. Intentionally facilitating PAL activities within the paired model did not affect student learning outcomes but was reported to add value by establishing positive habits that promoted opportunities for learning such as active observation and peer feedback and enhancing the use of 'downtime' that typically frustrated students. Student and clinical educator satisfaction was maximised when PAL was utilised flexibly and training was provided prior to the placement starting.

9.3.1 Implications for clinical education researchers

This research demonstrates that it is possible to employ experimental research designs and mixed methods approaches to produce robust evidence on approaches to clinical education practice in the clinical setting. The cross-over design utilised in study 2 was effective in addressing ethical concerns about exposing students to alternate education approaches whilst accounting for confounding factors. The stepped wedge design utilised in study 3 enabled all clinical educator participants to be exposed to the intervention (PAL training) whilst maintaining an experimental design. The importance of stakeholder engagement and the participatory approach in the successful completion of this research program cannot be understated. It is vital to involve clinical educators in the design of any clinical education research program, not only as future participants and data collectors but also so that the outcome measures and data analysis resonate with them in order for any future evidence to be incorporated into practice.

9.3.2 Implications for clinical education co-ordinators implementing placement models

This research was also able to refute a number of misconceptions held about PAL by clinical educators. When considering implementing PAL in clinical education practice, it is important to identify conceptions held about PAL by clinical educators in order to address barriers to its use. When considering implementing PAL placement models, facilitators are encouraged to openly discuss these assumptions and any others that may emerge from stakeholder engagement. There was no evidence that student involvement in PAL would result in a reduction in the students' ability to perform independently, a limitation to students' exposure to 'hands on' patient experiences, inferior quality of information being shared between students compared with what would be taught by the clinical educator or increased clinical educator workload.

9.3.3 Implications for clinical educators utilising PAL

Clinicians indicated that PAL in the clinical environment can present specific challenges including being prepared to structure and facilitate PAL within the busy clinical environment, engaging students in PAL as a valid clinical activity and managing sub-optimal peer relationships. This research indicates that clinical educators should assess and develop their capability for facilitating PAL through reflection on prior experiences and accessing training and resources where required. Clinical educators can create opportunities for students to take part in PAL by selecting the most appropriate format, structure and activities for peer interaction, enabling student autonomy and structuring the environment to maximise cooperation. Participants suggested that students may be motivated to participate in PAL through effective orientation to the benefits for them as learners and future health professionals, and also to how PAL links to the learning and assessment goals of the placement. Our findings suggest that introducing PAL does not require the clinical educator to step away from their teaching responsibilities in the workplace, but rather asks them to work differently. The role of the clinical educator was reported as critical in modelling the benchmarks for clinical and educational practice and providing individualised feedback and guidance.

9.4 Future research directions

We still do not fully understand what combination of learning activities and experiences constitute an 'ideal' clinical placement for students. There are a near infinite number of permutations and combinations of how learning experiences can be varied in clinical education, thus finding an ideal model is unlikely to be feasible in real life. What is important however is that the leading candidate approaches be considered and the robust evidence supporting their impacts be developed. This research should be the first in a series of studies that seeks to develop high quality research evidence investigating these approaches. Randomised trials in other education areas are present in the literature (Watson et al., 2012), however other approaches such as interprofessional clinical education models, variations in student: educator ratios and student-led clinics are yet to be subjected to this form of evaluation.

This is one of few projects in the allied health professions where students have recorded daily statistics enabling a quantitative measure of the student learning activities as they related to peer assisted learning. There is an opportunity for further research to investigate the relationship between student learning outcomes, student satisfaction and the learning activities and opportunities (both PAL and individual) that are accessed during the placement.

Longitudinal studies could investigate how students evolve in their PAL practices over time, and whether these competencies influence their capacities to operate in the workforce. In particular, practitioner skills relating to collaborative practice, teaching peers and providing feedback to others could be tracked longitudinally, compared to practitioners who were raised on a 'traditional' supervisor led clinical education curriculum. A longitudinal research design would also afford investigation of how educators' capacity to facilitate PAL changes over time.

Student preparation for participation in PAL clinical education models was not investigated in the present study but could be the subject of future research. In this study we focussed more so on preparing clinical educators to be able to deliver a PAL model of clinical education. In study 1, clinical educators participated in up to 8 hours of PAL training whereas students attended one 2-hour tutorial. In study 2, training in PAL was only provided to clinical educators. This partiality towards clinical educator versus student preparation for participation in PAL may have influenced the findings of this research program and the effect of educating and preparing students to engage in PAL on clinical placements could be explored further.

The effect of utilising the paired student placement model on placement capacity has not been examined experimentally or economically evaluated. It is assumed in the literature that if clinical educators supervise multiple students concurrently, compared to individually, then clinical placement capacity will be improved. However, if clinical educators are not able to implement the paired model consistently throughout the year and sustainably then there may not be a long term gain in capacity. How other areas of the hospital are effected by the increase in students concurrently also needs to be accounted for. For example, if multiple Occupational Therapy students are attending clinical placement on one hospital ward, this could impact the capacity for other professions to place students on that ward, leading to no overall gain in placement capacity at the health service or faculty level. The multi-stakeholder structure of clinical education in the Australian context complicates the economic evaluation of clinical education models, however approaches such as that employed by Haines and colleagues (2014) could be utilised.

9.4 Conclusion

This thesis has examined the role of PAL in allied health professional clinical education placements. The research studies developed and tested a PAL model of clinical education for paired allied health professional students and a PAL training module for allied health clinical educators supervising pairs of students. Through these studies, a range of practical implementation strategies and a flexible framework for practice have been developed, underpinned by notions of experiential learning.

Although student learning outcomes were not affected by the PAL model, this thesis advocates for the specific use of PAL within the paired student clinical education model to add value by establishing positive learner habits. Providing training to clinical educators was an effective means by which to impact on the PAL clinical education activities students were involved in. Using a PAL framework may be useful in supporting clinical educators to confidently move to a 'multiple student to clinical educator' model which has the potential to positively impact on the current shortage of clinical education placements.

PAL is a complex social interaction involving many stakeholders and as such, it is a challenging approach to research, teach and apply. Students and clinical educators identified many positives about using PAL but were dissatisfied with the rigidity of the prescribed PAL model, which reflects the complexity of the intervention. The recommendations that have arisen from this research focus on the skill development of learner and educator parties, and also the conditions that favour opportunities for PAL in the workplace setting. As such the major recommendations for implementation are that education and support are provided to all stakeholders (as early as possible) and that PAL is utilised flexibly as deemed appropriate by skilled participants.

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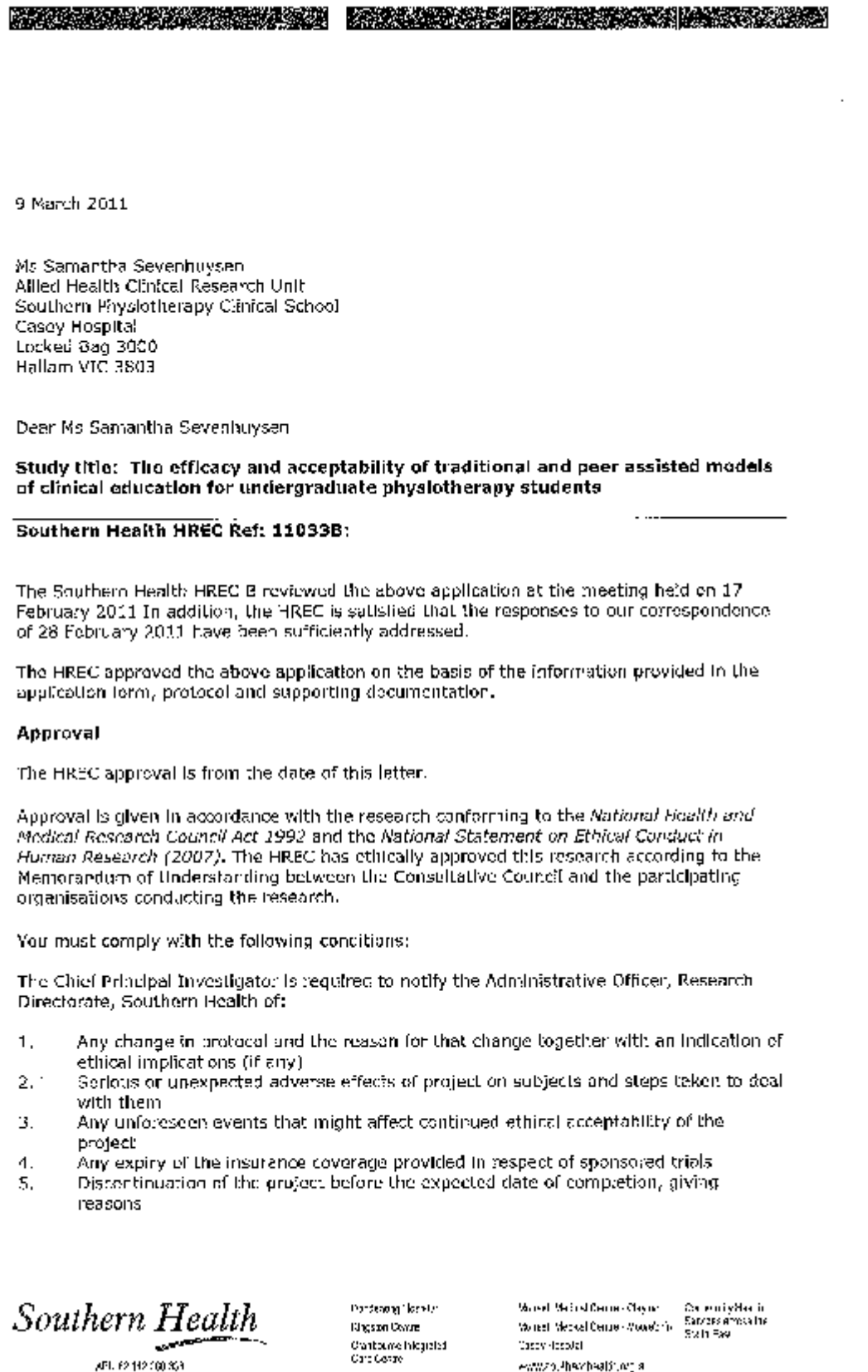
Appendices

- A. [Ethics approvals](#)
- B. [Tools used in the Peer Assisted Learning Model](#)
- C. [Data collection templates](#)
- D. [Survey templates](#)
- E. [Focus Group documents](#)
- F. [Resources developed](#)
- G. [Study conducted prior to enrolment](#)

Appendix A Ethics approvals

PAL RCT health service ethics approval

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MONASH University

Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

Date: 6 April 2011

Project Number: CF11/0881 - 2011000449

Project Title: The efficacy and acceptability of traditional and peer assisted models of clinical education for undergraduate physiotherapy students

Chief Investigator: Mr Stephen Maloney

Approved: From: 6 April 2011 to 6 April 2016

Terms of approval

1. The Chief investigator is responsible for ensuring that permission letters are obtained, if relevant, and a copy forwarded to MUHREC before any data collection can occur at the specified organisation. Failure to provide permission letters to MUHREC before data collection commences is in breach of the National Statement on Ethical Conduct in Human Research and the Australian Code for the Responsible Conduct of Research.
2. Approval is only valid whilst you hold a position at Monash University.
3. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by MUHREC.
4. You should notify MUHREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
5. **Complaints:** The researchers are required to inform MUHREC promptly of any complaints made about the project, whether the complaint was made directly to a member of the research team or to the primary HREC.
6. **Amendments to the approved project (including changes in personnel):** Requires the submission of a Request for Amendment form to MUHREC and must not begin without written approval from MUHREC. Substantial variations may require a new application.
7. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
8. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
9. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
10. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by MUHREC at any time.
11. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

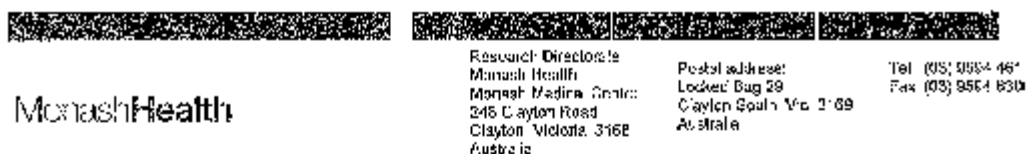
Professor Ben Canny
Chair, MUHREC

cc: Ms Samantha Sevenhuysen, Assoc prof Terry Haines; Dr Elizabeth Molloy; Prof Jenny Keating; Ms Wendy Nickson; Ms Melanie Farlie; Ms Lyn Raitman; Dr Elizabeth Skinner

Postal – Monash University, Vic 3800, Australia
Building 3E, Room 111, Clayton Campus, Wellington Road, Clayton
Telephone +61 3 9905 5490 Facsimile +61 3 9905 3831
Email muhrec@adm.monash.edu.au www.monash.edu/research/ethics/human/index.html
ABN 12 377 614 012 CRICOS Provider #00008C

Multidisciplinary trial ethics approval

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10 May 2013

Ms Samantha Sevenhuysen
Allied Health Clinical Research Unit
2 Vincent Court
Cranbourne North Vic 3977

Dear Ms Sevenhuysen

Study title: Promoting Peer Assisted Learning In Allied Health Clinical Placements
Monash Health HREC Ref: 13073B

The Monash Health HREC B reviewed the above application at the meeting held on 21 March 2013. In addition, the HREC is satisfied that the responses to our correspondence of 2 April 2013 have been sufficiently addressed.

The HREC approved the above application on the basis of the information provided in the application form, protocol and supporting documentation.

This reviewing HREC is accredited by the Consultative Council for Human Research Ethics under the single ethical review system.

Approval

The HREC and Site Specific Authorisation approval is from 10 May 2013.

Approval is given in accordance with the research conforming to the *National Health and Medical Research Council Act 1992* and the *National Statement on Ethical Conduct In Human Research (2007)*. The HREC has ethically approved this research according to the Memorandum of Understanding between the Consultative Council and the participating organisations conducting the research.

Approval is given for this research project to be conducted at the following sites and campuses:

- Monash Health
 - Monash Medical Centre, Clayton
 - Dandenong Hospital
 - Casey Hospital

You must comply with the following conditions:

The Chief Principal Investigator is required to notify the Research Directorate, Monash Health of the following:

1. Any change in protocol and the reason for that change together with an indication of ethical implications (if any)
2. Serious or unexpected adverse effects of project on subjects and steps taken to deal with them

Appendix B Tools used in the Peer Assisted Learning Model

SNAPPS tool



MONASH University
Medicine, Nursing and Health Sciences

Southern Health

SNAPPS

Name:.....

Summarise briefly the history and findings
Narrow the problem list to two or three main problems with rationale
Analyse the problems to prioritise in order of importance
Probe the supervisor by asking questions about uncertainties, difficulties or alternative approaches
Plan management (ie further assessment/intervention/discharge planning) for the patients problems
Select a case-related issue for self directed learning

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Peer Observation Record

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PEER OBSERVATION RECORD

APP DOMAIN	Name of student completing this form: _____ Date: _____ Name of student being observed: _____	
	COMMENTS	STRATEGIES FOR IMPROVEMENT
PROFESSIONAL BEHAVIOUR		
COMMUNICATION		
ASSESSMENT		
ANALYSIS & PLANNING		
INTERVENTION		
EVIDENCE-BASED PRACTICE		
RISK MANAGEMENT		

DISCUSSION:	
Observer asks: How did you feel the encounter went?	Together, summarise strengths:
Observer asks: What went well and why?	
Observer comments: What went well and why.	Together, identify 3 improvement strategies to focus on: 1. 2. 3.
Observer asks: What could be done better and how?	
Observer comments: What could be done better and how.	
Comments for supervisor:	

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Complexity-Risk Matrix

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Complexity-Risk Matrix

Complexity	Situation						
High complexity							
Medium complexity							
Low complexity							
		Low risk		Medium risk		High risk	

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Appendix C Data collection templates

Clinical Educator Statistics

CLINICIAN SERVICE STATISTICS

Initials: Stream:	Block: Site:	Monday Date:	Tuesday Date:	Wednesday Date:	Thursday Date:	Friday Date:
Number of students supervised						
Model of clinical education used						
Minutes spent on direct student supervision						
Minutes spent on student related administration						
Minutes spent on direct teaching (tutorials etc)						
Minutes spent on student assessment						
Minutes spent on student feedback						
Minutes spent on non student related administrative tasks						
Minutes spent on non student related quality tasks						
Total number of patients seen (clinician + students)						
Minutes spent on patient attributable activity						
Minutes spent on research						
Minutes spent on other activities – please document activities						
Minutes of overtime worked						

Comment on any extenuating circumstances which significantly affected the balance of your workload this week (if applicable):

Please rate your level of agreement with the following statement on the scale provided (please circle):

I was happy with the balance of my workload (patient care/clinical education/ admin/quality/research) this week.

Strongly disagree

Disagree

Neutral

Agree

Strongly Agree

Student Activity Record

STUDENT NAME: STUDENT CLINICAL EDUCATION ACTIVITY RECORD SUPERVISOR NAME:

ACTIVITY: Student inserts number of times per day of occurrence.	Week 1					Week 2					Week 3					Week 4					Week 5				
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 1	Day 2	Day 3	Day 4	Day 5	Day 1	Day 2	Day 3	Day 4	Day 5	Day 1	Day 2	Day 3	Day 4	Day 5	Day 1	Day 2	Day 3	Day 4	Day 5
Student observed clinician performing an assessment																									
Student observed clinician performing intervention																									
Student received oral feedback - without peer present																									
Student received oral feedback - with peer present																									
Student received written feedback from educator																									
Student received written feedback from peer																									
Student received feedback related to placement assessment (without peer present)																									
Educator observed student performing an assessment																									
Educator observed student performing a treatment																									
Educator observed student performing a full assessment and treatment																									
Educator observed student pair with a patient																									
Student observed peer performing an assessment																									
Student observed peer performing a treatment																									
Student observed peer performing a full assessment and treatment																									
Student worked with patient independently (without clinician or peer)																									
Student worked with patient and peer (without direct clinician observation)																									
Student worked on patient related preparation/admin independently																									
Student worked on patient related preparation/admin with peer																									
Student worked on non-patient related tasks independently																									
Student worked on non-patient related tasks with peer																									
Number of patients seen																									
Other																									

Appendix D Surveys

PAL RCT student survey 1 – end of each rotation

(double click to open the object and view all pages)

Peer Assisted Learning (PAL) Project

As part of the research in which you are participating, please find below the survey you are requested to complete at the end of each rotation.

All information is strictly confidential.

Thank you for your participation in this project.

*** 1. Sex**

☐ Male

☐ Female

*** 2. Age**

☐ 18-20

☐ 21-23

☐ 24-26

☐ 27-29

☐ 30>

*** 3. How many years of tertiary study have you completed prior to this year?**

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7

☐ 8>

*** 4. This clinical placement is**

☐ Block 1

☐ Block 2

☐ Block 3

PAL RCT student survey 2 – end of intervention

(double click to open the object and view all pages)

PAL Student Survey-end of intervention

Peer Assisted Learning (PAL) Project-end of intervention

During your clinical placements you were exposed to two styles of clinical education. One style, which we will call 'traditional learning', is where you were being directly supervised by clinicians. Another style, which we will call 'peer-assisted learning' or PAL, is where you were asked to work more collaboratively with your student pair, sharing learning opportunities. Now that you have experienced clinical rotations that have included both these styles, we would like to learn more about your perceptions of the clinical education experiences.

All information is strictly confidential.

Thank you for your participation in this project.

*** 1. Sex**

- ☐ Male
☐ Female

*** 2. Age**

- ☐ 18-20
☐ 21-23
☐ 24-26
☐ 27-29
☐ 30->

*** 3. How many years of tertiary study have you completed prior to this year?**

- ☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7
☐ 8->

*** 4. I have completed three rotations of clinical education**

- ☐ Yes
☐ No

If no, please explain the circumstances of non-completion and indicate which rotation(s) was affected eg injured rotation 2

PAL RCT clinical educator survey 1 – end of each rotation

(double click to open the object and view all pages)

1.

1. What is your age?

- ☐ 20-25
- ☐ 25-30
- ☐ 30-35
- ☐ 35-40
- ☐ 40-45
- ☐ 45-50
- ☐ 50-55
- ☐ Over 55

2. How many years of clinical experience have you had?

- ☐ Less than 1
- ☐ 1 - 3
- ☐ 3 - 5
- ☐ 5 - 10
- ☐ More than 10

3. How confident are you in clinical practice?

- ☐ Not at all
- ☐ Somewhat confident
- ☐ Neutral
- ☐ Confident
- ☐ Very confident

4. What is your qualification level?

- ☐ Bachelor of Physiotherapy
- ☐ Graduate certificate
- ☐ Graduate diploma
- ☐ Masters
- ☐ PhD

PAL RCT clinical educator survey 2 – end of intervention

(double click to open the object and view all pages)

1.

1. What is your age?

- ☐ 20-25
- ☐ 25-30
- ☐ 30-35
- ☐ 35-40
- ☐ 40-45
- ☐ 45-50
- ☐ 50-55
- ☐ Over 55

2. How many years of clinical experience have you had?

- ☐ Less than 1
- ☐ 1 - 3
- ☐ 3 - 5
- ☐ 5 - 10
- ☐ More than 10

3. How confident are you in clinical practice?

- ☐ Not at all
- ☐ Somewhat confident
- ☐ Neutral
- ☐ Confident
- ☐ Very confident

4. What is your qualification level?

- ☐ Bachelor of Physiotherapy
- ☐ Graduate certificate
- ☐ Graduate diploma
- ☐ Masters
- ☐ PhD

Peer Assisted Learning in Clinical Education Workshop					
Date:	Venue:		Pre-Course Survey		
Complete this questionnaire by ticking the box that best represents your response to the following statements					
Statements	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
I think I am able to:					
Define Peer Assisted Learning (PAL)					
Incorporate PAL activities into my clinical teaching					
Detail the evidence for the advantages and disadvantages of PAL to my colleagues					
Recognise barriers to cooperative learning					
Minimise barriers to cooperative learning in my teaching environment					
Structure a paired student placement utilising PAL tools & activities					
Utilise strategies to manage of sub-optimal peer relationships					

Multidisciplinary trial clinical educator survey 2 – on completion of education

(double click to open the object and view all pages)

Peer Assisted Learning in Clinical Education Workshop					
Date	Venue:	Post-Course Evaluation			
Complete this questionnaire by ticking the box that best represents your response to the following statements					
Statements	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
I think I will now be able to:					
Define Peer Assisted Learning (PAL)					
Incorporate PAL activities into my clinical teaching					
Detail the evidence for the advantages and disadvantages of PAL to my colleagues					
Recognise barriers to cooperative learning					
Minimise barriers to cooperative learning in my teaching environment					
Structure a paired student placement utilising PAL tools & activities					
Utilise strategies to manage of sub-optimal peer relationships					

What changes do you think you will make to your practice as a clinical educator as a result of completing this workshop?

Multidisciplinary trial clinical educator survey 3 – completed at each step

(double click to open the object and view all pages)

Version 1.1 27 February 2013

Clinician Survey (Delivered at 2-month intervals)

Demographic Data:

Age

Discipline

Years experience and confidence in clinical practice

Qualification level

Grade employed as

Years experience and confidence in clinical education

Average number of students educated per year

Prior experience with PAL

Attended workshop Y/N

Survey Questions:

Please rate your level of agreement with the following statements on the scale provided. [Following questions on 5 pt Likert Scale]. Over the past 2 months:

- I was effectively able to observe and gauge students' clinical ability/competency (strongly disagree – strongly agree)
- Providing clinical education was personally stressful (strongly disagree – strongly agree)
- There was sufficient time available for client service (strongly disagree – strongly agree)
- My students displayed a high degree of anxiety (strongly disagree – strongly agree)
- The clinical education I provided was effective (strongly disagree – strongly agree)
- My clinical education duties were burdensome (strongly disagree – strongly agree)
- I facilitated peer-assisted learning strategies with my students (strongly disagree – strongly agree)
- My educational style and behaviors have changed recently (strongly disagree – strongly agree)
- I was satisfied with the outcome of the peer-assisted learning strategies I used with my students (not at all satisfied – extremely satisfied)

[The following questions would be open text]

- What do you think were the strengths of your clinical education experience?
- What did you think were the weaknesses of your clinical education experience?
- Any other comments

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Student Focus Groups

Peer Assisted Learning in Clinical Education

Facilitator: Sue Slade

The student focus groups will form an integral part of the research into the effect of peer assisted learning on student learning outcomes and satisfaction with the clinical education experience. They will provide an opportunity for students share their experiences of peer assisted and traditional learning whilst on clinical placement, and their opinions about the elements of the peer assisted learning model.

The focus groups will be held on Thursday 15th September at Monash Medical Centre, Clayton campus. Students will be allocated to a specific focus group time.



For any further information please contact
Sam Sevenhuysen
Sam.Sevenhuysen@southernhealth.org.au

0417 050 815

PAL RCT student focus group prompts

(double click to open the object and view all pages)

Physiotherapy Student Focus Groups

PAL Project

Sept 15 2011

NB Three student focus groups will be held at the completion of the 15 weeks of clinical education. Students have completed 3 x 5 week placements in cardio, neuro & musc. Only cardio and neuro were involved in the study. Each pair has undertaken both the PAL and Tradition models in their cardio and neuro blocks.

Pairs have been split where possible, into separate groups to encourage honest descriptions of the experience of the PAL versus Traditional Supervision Model.

Focus Group Introduction

- a) Hand out project summary for reading, remind participants that their consent has already been obtained by Stephen Maloney prior to clinics starting.
- b) Welcome: Brief description of the purpose of the focus group- to capture your experience and your perceptions of the PAL and traditional clinical education placements (neuro and cardio). You may also draw on your experience of the musc placement (as a proxy for a 'traditional supervision model').
- c) Aim is to Audio-tape, and transcribe the data verbatim. The identity of all participants will be protected. In the Focus Groups, we will use your real names, but these will be replaced by pseudonyms in transcription. If anyone feels uncomfortable during the Focus Group, please raise your hand, and we can stop the recording.
- d) Has anybody been part of a focus group before? Brief description of the origin and purpose of FG method (to capture experience, and to bounce ideas off each other so that researchers can gain an in depth understanding of your experience. We're not looking for consensus here, there are no right or wrong responses, we're after your thoughts on the experience of PAL, and how that compared to your experience of a more traditional placement, led by the clinical educator.
- e) Any Questions before we start? If you are happy to be part of the audio-taped focus group, let's proceed.

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Educator Focus Groups & Debriefing

Peer Assisted Learning in Clinical Education

Facilitator: Dr. Liz Molloy

The educator focus groups will form an integral part of the research into the effect of peer assisted learning on educator workload and satisfaction with the clinical education experience. They will provide an opportunity for educators to share their experiences of peer assisted and traditional learning and their opinions about the elements of the peer assisted learning model.

The focus groups will be immediately followed by a debriefing session and celebration to thank the educators for their time and participation in the research trial.

- Session 1: Thursday 22nd September, 3:00pm–4:30pm, Physiotherapy Education Room, Monash Medical Centre, Clayton
- Session 2: Tuesday 27th September, 3:00pm–4:30pm, Seminar Room 2, Dandenong Hospital

RSVP essential to Sam.Sevenhuysen@southernhealth.org.au by September 14.



For any further information please contact
Sam Sevenhuysen
Sam.Sevenhuysen@southernhealth.org.au

0417 050 815

PAL RCT educator focus group prompts

(double click to open the object and view all pages)

Physiotherapy Clinical Educator Focus Groups PAL Project Sept 15 2011

Focus Group Introduction

A) Hand out Explanatory Statements and Informed Consent Forms for reading

B) Welcome: Brief description of the purpose of the focus group- to capture your experience and your perceptions of the PAL and traditional clinical education placements (neuro and cardio).

C) Has anybody been part of a focus group before?

Brief description of the origin and purpose of FG method (to capture experience, and to bounce ideas off each other so that researchers can gain an in depth understanding of your experience. We're not looking for consensus here, there are no right or wrong responses, we're after your thoughts on the experience of PAL, and how that compared to your experience of a more traditional placement, led by the clinical educator.

D) Aim is to Audio-tape, and transcribe the data verbatim

The identity of all participants will be protected. In the Focus Groups, we will use your real names, but these will be replaced by pseudonyms in transcription. If anyone feels uncomfortable during the Focus Group, please raise your hand, and we can stop the recording.

E) Any Questions before we start?

If you are happy to be part of the audio-taped focus group, please sign the Informed Consent Form in front of you

Focus Group Questions

1) Can you describe your experience of the Peer Assisted Learning Placement?

2) What was involved in the PAL placement, and how did this compare to the traditional approach to clinical education?

3) From your perspective what, if any, were the advantages of the PAL Placement?

- probe - can you provide examples?
- Probe - did you find any specific tools in the PAL placement helpful?
 - SNAPPS
 - The complexity risk matrix
 - The peer observation record

Multidisciplinary trial student focus group prompts

(double click to open the object and view all pages)

PAL Student Focus Groups

NB. Four student focus groups will be held over the next three months. Students from various allied health disciplines and Monash Health sites have been invited to participate. All students have been on placement in a pair for at least part of their placement.

Focus Group Introduction

- a) Remind participants that their consent has already been obtained. This focus group is planned to run for 1 hour and finish by 12pm.
- b) Welcome: Brief description of the purpose of the focus group- to capture your experience and your perceptions of being on placement in a pair and your utilization of peer assisted learning (PAL) strategies. You may also draw on your experience in previous placements.
- c) PAL definition: think of PAL as any time your fellow students have contributed to your placement experience. It could take many forms, from social support, informal debriefing, talking through cases, practicing or teaching skills from/to one another, peer supervision, observation, modeling, feedback etc.
- d) Aim is to Audio-tape, and transcribe the data verbatim. The identity of all participants will be protected. In the Focus Groups, we will use your real names, but these will be replaced by pseudonyms in transcription. If anyone feels uncomfortable during the Focus Group, please raise your hand, and we can stop the recording.
- e) Ask students to introduce themselves – first name, discipline
- f) Has anybody been part of a focus group before? Brief description of the origin and purpose of FG method (to capture experience, and to bounce ideas off each other so that researchers can gain an in depth understanding of your experience). We're not looking for consensus here, there are no right or wrong responses, we're after your thoughts on the experience of PAL, and how that compared to your experience of a more traditional placement if you have had one.
- g) Any Questions before we start? If you are happy to be part of the audio-taped focus group, let's proceed.

Multidisciplinary trial student clinical educator group prompts

(double click to open the object and view all pages)

PAL Educator Focus Groups

NB. Clinical educators are from varying allied health disciplines, settings and backgrounds. Involvement in paired students and PAL may have been for a whole block, or part, or may have been informal on days where multiple students were on site together (rather than strictly pairs).

Focus Group Introduction

- a) Remind participants that their consent has already been obtained. This focus group is planned to run for 1 hour and finish by 12pm.
- b) Welcome: Brief description of the purpose of the focus group- to capture your experience and your perceptions of supervising students and your utilization of peer assisted learning (PAL) strategies. You may also draw on your experience in previous placements.
- c) PAL definition: think of PAL as any time your students contributed to each others placement experience. It could take many forms, from social support, informal debriefing, talking through cases, practicing or teaching skills from/to one another, peer supervision, observation, modeling, feedback etc. It may have been facilitated by you or have happened more naturally or informally between the students.
- d) Aim is to Audio-tape, and transcribe the data verbatim. The identity of all participants will be protected. In the Focus Groups, we will use your real names, but these will be replaced by pseudonyms in transcription. If anyone feels uncomfortable during the Focus Group, please raise your hand, and we can stop the recording.
- e) Ask participants to introduce themselves – first name, discipline
- f) Has anybody been part of a focus group before? Brief description of the origin and purpose of FG method (to capture experience, and to bounce ideas off each other so that researchers can gain an in depth understanding of your experience). We're not looking for consensus here, there are no right or wrong responses, we're after your thoughts on the experience of PAL, and how that compared to your experience of a more traditional placement if you have had one.
- g) Any Questions before we start? If you are happy to be part of the audio-taped focus group, let's proceed.

Appendix F Resources developed

PAL workshop slides

(double click to open the object and view all pages)



Supervising students in pairs utilising peer assisted learning

PAL workshop session plan

(double click to open the object and view all pages)

Workshop Plan- Supervising students in pairs utilising peer assisted learning

Workshop outcomes:

At the end of the session the participant will be able to:

- Demonstrate how to structure a paired student placement utilising PAL tools & activities
- Identify how to utilise the advantages & minimise the disadvantages of paired placements
- Discuss approaches to management of sub-optimal peer relationships

Required equipment:

- Laptop & data projector
- Slides as handouts
- Print out for sub-optimal pairs activity
- Workshop evaluation forms
- Example tools as handouts:
 - Peer observation record with instructions (APP)
 - Peer observation record with instructions (SPEF)
 - SNAPPS
 - SNAPPS example
 - Complexity risk with instructions
 - Pendleton Model of Feedback

Workshop outline

Session component	Learner activity	Teacher activity	Facilitator	Time
FOUNDATION Mood, motivation, usefulness, content intro, activating underpinning knowledge, objectives	Facilitator Introductions	Introduction (slide 1). Introduce facilitator/s Logistical info e.g. toilets. format of session (theory block, then activity, break in the middle), Please put all phones/pagers on silent Attendance sign in sheet Briefly outline the 'what's in it for them' and why we want to move to pairs. Format of the session (theory, activities, interactive session and involves participation, break in the middle) Hand out evaluation sheet for participants to write in their pre-workshop ratings	Sam	10 min
	Learner introductions and share previous experiences with pairs	Activity 1: Whole group: Participants intro: what's the participants experience with pairs (slide 2)		
	Observe PowerPoint presentation	Session Objectives (slide 3)		

PAL “train the trainer” workshop session plan

(double click to open the object and view all pages)

Session Plan: Train the Trainer: Supervising students in pairs utilising peer assisted learning

Workshop outcomes:

At the end of the session the participant will be able to:

- Discuss the needs and characteristics of learners that would attend a PAL workshop
- Identify the learning outcomes and content of the PAL workshop
- Identify and access the correct learning materials and resources to facilitate the PAL workshop
- Demonstrate delivery techniques involved in the PAL workshop
- Demonstrate the ability to discuss feedback with learners

Required equipment:

- Laptop & data projector
- Slides as handouts
- Peer assisted Learning: Facilitators Toolkit
- Print out for sub-optimal pairs activity
- Workshop evaluation forms

Workshop outline

Session component	Learner activity	Teacher activity	Facilitator	Time
FOUNDATION Mood, motivation, usefulness, content intro, activating underpinning knowledge, objectives	Sharing previous experiences with pairs	Welcome and Intro self (slide 1) Explain ground rules- interactive and involves participation. Explain the structure of the day Phones and pagers on silent. Session outline (Slide 2) Facilitators toolkit (slide 3)	Sharon	10 min
		Run the PAL workshop 3.5 hours (slide 4-20)	Sharon and Sam	1hr 40
BREAK – 15 mins				
		Complete PAL workshop (slide 21-42)	Sharon and Sam	1 hr 25
LUNCH BREAK – 45 mins				
	Observe power point presentation	Introduce afternoon session Ask for any questions or comments from the am session Provide session outline (Slide 43) Session objectives (slide 44)	Sharon	10 mins
	Observe power point presentation	Facilitating groups (slide 45)	Sharon	10 mins
	Participate in activity	Activity: PAL workshop Practice (slide 46) Practice slides (slide 47) Introduce activity and split into 2 groups/rooms	All	10 mins

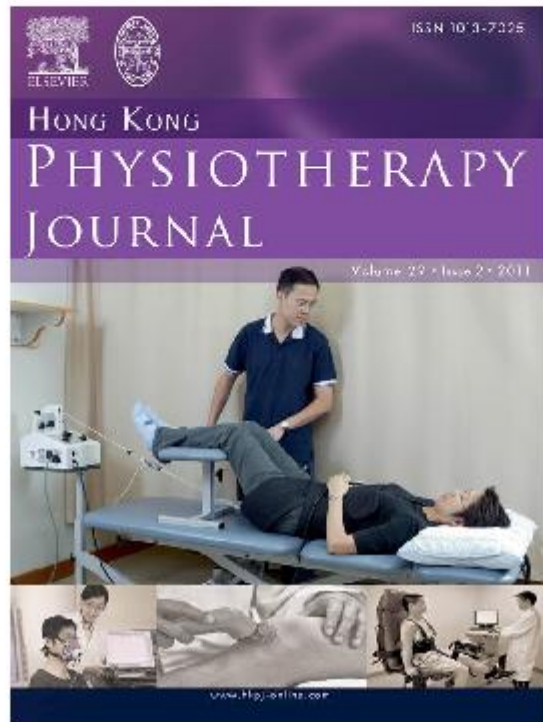
PAL online clinical supervision training modules

- Co-author of the PAL module on the Clinical Supervision Support Across Contexts web page
<https://clinicalsupervisionsupport.org/course/view.php?id=40>
- Author of the PAL online learning module offered as an elective unit as part of the Masters in Health Professional Education at Monash University

Appendix G Study conducted prior to enrolment

(Double click to open publication: Sevenhuysen, S. & Haines, T.P. (2011). The Slave Of Duty: Why Clinical Educators Across The Continuum Of Care Provide Clinical Education In Physiotherapy. Hong Kong Physiotherapy Journal, 29, 64-70.)

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