



**UNIVERSITY OF  
CANBERRA**

AUSTRALIA'S CAPITAL UNIVERSITY

***FEED OUR FUTURE***

A pragmatist mixed-methods exploration of Individual Case Management (ICM) placements for dietetic students outside the hospital setting

**Rachel Bacon**

MSc (Nutr & Diet), BSc (Nutr)

Thesis submitted in fulfilment of the requirements for the degree of  
Doctor of Philosophy in Health (by Published Works)

University of Canberra

2015

## **Abstract**

### *Background*

Our aging population and the increase in chronic disease is driving a move towards a consumer-led integrated health care system, with an increased need for interdisciplinary primary health care services. Expanding the settings used for Individual Case Management (ICM) placements from hospitals to primary health care settings could increase placement capacity and may better align with the national health reform and health workforce development agendas. This research aims to (1) explore the experiences of key stakeholders with ICM placements for dietetic students outside the hospital setting; (2) identify Australian tertiary ICM placement practices; (3) explore student dietitians' development of ICM competencies outside the hospital setting; and (4) support supervisors in their competency-based assessment practices.

### *Methods*

Within a pragmatist framework, this research uses mixed-methods, and is conducted over three phases. Phase I presents an evaluative case study of an innovative non-hospital ICM setting; Phase 2 includes: (1) a national online survey with placement coordinators at Australian Universities offering accredited Dietetics programs, and (2) a modified-three round Delphi study with eight experienced clinical supervisors; Phase 3 uses a Design-Based research approach to develop an online program for ICM clinical supervisors in competency-based assessment.

### *Results*

FEED OUR FUTURE: *A pragmatist mixed methods exploration of Individual Case Management (ICM) placements outside the hospital setting.*

Phase 1 demonstrated the potential for a non-hospital ICM placement setting to meet the needs of consumers and exceed expectations, while providing a quality learning experience for student dietitians. In Phase 2 the experienced supervisors agreed that, although most universities are using hospitals for their ICM placements, students could develop and demonstrate entry-level ICM competence in non-hospital settings, with adjustments made for nuanced practice differences. This research highlighted the subjectivity of current assessment practices while also demonstrating how through the sharing of assessments and dialogue supervisors can gain a shared understanding of entry-level performance. Phase 3 described the development of a video-based constructivist online program in competency-based assessment showcasing the potential for online learning to support clinical supervisors to achieve more credible and defensible assessment practices.

### *Conclusion*

Non-hospital clinical placement settings can provide appropriate experiences for student dietitians to develop individual case management competence, prepare for the future workforce and support the delivery of healthcare in underserved settings. This research recommends: (1) universities revisit clinical education curricula and consider the inclusion of non-hospital sites in the ICM placement mix; (2) a mix-methods approach to assessment is adopted with the aim of achieving a more comprehensive and in-depth understanding of the student's development and demonstration of ICM competence, (2) a constructivist video-based online program is used to support clinical supervisors in their assessment of student-dietitians during ICM placements.

## Publications and Presentations

### Published manuscripts

- 1 **Bacon, R**, Williams, L, Grealish, L, Jamieson, M 2015, ‘Student-Assisted Services (SAS): An Innovative Clinical Education Model that Prepares Graduates for the Future, Contributes to Health Service Delivery and Addresses Internship Shortages’, *Journal of the Academy of Nutrition and Dietetics*, vol. 115, no.3, pp. 351-352.
- 2 **Bacon, R**, Williams, L, Grealish, L 2015, ‘Nursing Homes and Primary Health Care Clinics Provide Appropriate Settings for Student to Demonstrate Individual Case Management Clinical Competence’, *Nutrition and Dietetics*, vol. 72, no. 1, pp. 54-62.
- 3 **Bacon, R**, Williams, L, Grealish, L, Jamieson, M 2015, ‘Credible and Defensible Assessments of Entry-Level Clinical Competence: Insights from a Modified Delphi Study’, *Focus on Health Professional Education*, vol.17, no.3, pp.45-56.
- 4 **Bacon, R**, Williams, L, Grealish, L, Jamieson, M 2015, ‘Competency-Based Assessment for Clinical Supervisors: Design-Based Research on a Web-Delivered Program’, *JMIR Research Protocol*, vol. 4, no. 1, pp. e26.

### Presentations with peer reviewed abstracts

- 1 Palermo, C, **Bacon, R**, McPhee, N 2015, ‘Competency Based Assessment in Dietetics: Challenging the status quo (Workshop Seminar)’ *Dietitians Association of Australia 32<sup>nd</sup> National Conference*, Perth, 15 May.
- 2 **Bacon, R**, Williams, L, Grealish, L, Jamieson, M 2015, ‘*Feed Our Future: challenging supervisors’ assessment practices during clinical placements through online professional development. (Poster Presentation)*’, *Dietitians Association of Australia 32<sup>nd</sup> National Conference* Perth, 15 May.
- 3 **Bacon, R**, Williams, L, Grealish, L 2014, ‘Insights from a modified Delphi study: Supporting quality entry-level assessments during clinical placements’, *Australian and New Zealand Association for Health Professional Educators (ANZAHPE) Conference*, Gold Coast, 8 July.
- 4 **Bacon, R**, Williams, L, Grealish, L 2013, ‘The use of non-traditional placement settings for dietetic individual case management clinical placements by Australian Universities’, *Dietitians of Canada - National Conference*. Victoria British Columbia, 14 June.
- 5 **Bacon, R**, Williams, L, Grealish, L 2013, ‘Clinical Education – From Beds to Buses Reflections for the Challenges of Tomorrow (Plenary Presentation)’, *Dietitians Association of Australian National Conference* Canberra, 24 May.
- 6 **Bacon, R**, Kellett, J, Cheng, K, Grealish, L, Williams, L 2012, ‘Client’s satisfaction with a student-led dietetics clinic’, *16<sup>th</sup> International Congress of Dietetics*. Sydney, 5 September.

### *University-based presentations*

- 1 **Bacon, R**, Williams, L, Grealish, L, Jamieson, M 2014, 'Progress Presentation', Faculty of Health University of Canberra, 4 July.
- 2 **Bacon, R**, Williams, L, Grealish, L 2013, 'PhD Candidate Confirmation Seminar', Faculty of Health University of Canberra, 25 July.
- 3 **Bacon, R**, Williams, L, Grealish, L 2013, 'Oral Presentation. Faculty of Health – Residential Research School', University of Canberra, 20 February.
- 4 **Bacon, R**, Williams, L, Grealish, L 2012, 'Introductory Seminar: An exploration of non-traditional clinical placement settings', Faculty of Health Residential Research School University of Canberra, 16 November.

### *Awards*

- 1 Dietitians Association of Australia 2015, 'Presidents Award for Innovation' for the Development of *Feed Our Future: a Research and Web-based Program for Clinical Supervisors in Competency-based Assessment*, Perth, 15 May.
- 2 Dietitians Association of Australia 2015, 'Emerging Researcher Award' for the best research article from a first time author in *Nutrition & Dietetics*, Perth, 15 May.
- 3 University of Canberra Faculty of Health 2015 'Learning and Teaching Award', Canberra, 11 February.
- 4 University of Canberra 2014, 'Vice-Chancellor's Excellence Award - Citation for Outstanding Contribution to Student Learning (Scholarly Activities and Innovations)', Canberra, 24 October.
- 5 Health Workforce Australia (HWA) 2012, 'National Clinical Supervision Fellowship', Melbourne, 13 November.
- 6 16th International Congress of Dietetics 2012, 'New Conference Presenter Award - Highly Commended', Sydney, Sept 4-8.

## Table of Contents

<b>ABSTRACT</b> .....	<b>III</b>
<b>FORM B CERTIFICATE OF AUTHORSHIP OF THESIS</b> .....	<b>V</b>
<b>PUBLICATIONS AND PRESENTATIONS</b> .....	<b>VII</b>
PUBLISHED MANUSCRIPTS.....	VII
PRESENTATIONS WITH PEER REVIEWED ABSTRACTS.....	VIII
AWARDS.....	IX
<b>LIST OF TABLES</b> .....	<b>XIII</b>
<b>LIST OF FIGURES</b> .....	<b>XV</b>
<b>ABBREVIATIONS</b> .....	<b>XVII</b>
<b>ACKNOWLEDGEMENTS</b> .....	<b>XIX</b>
<b>PREFACE</b> .....	<b>XXI</b>
THESIS OUTLINE.....	XXVII
<b>CHAPTER 1: INTRODUCTION AND RESEARCH RATIONALE</b> .....	<b>1</b>
<b>CHAPTER 2: LITERATURE REVIEW</b> .....	<b>7</b>
2.1 THE PROFESSIONS .....	7
2.2 WHAT IS COMPETENCE AND HOW IS IT DEFINED IN DIETETICS? .....	10
2.3 THE DEVELOPMENT OF COMPETENCE .....	17
2.4 ASSESSMENT AND THE ASSESSMENT OF COMPETENCE IN THE CLINICAL SETTING .....	22
2.5 THE DEVELOPMENT OF COMPETENCY STANDARDS USING DIETETICS AS A CASE EXAMPLE .....	26
2.6 THE CHALLENGES OF WORKPLACE ASSESSMENT .....	35
2.7 TRAINING ASSESSORS IN COMPETENCY-BASED ASSESSMENT .....	38
2.8 RESEARCH QUESTIONS .....	40
<b>CHAPTER 3: METHODOLOGICAL BACKGROUND</b> .....	<b>43</b>
3.1 THE PHILOSOPHICAL FRAMEWORK .....	43
3.2 AN OVERVIEW OF THE METHODS.....	47
3.3 RESEARCH METHODOLOGY .....	49
3.4 ETHICAL CONSIDERATIONS .....	67
<b>CHAPTER 4: STUDENT-ASSISTED SERVICES (SAS): AN INNOVATIVE CLINICAL EDUCATION MODEL THAT PREPARES GRADUATES FOR THE FUTURE, CONTRIBUTES TO HEALTH SERVICE DELIVERY AND ADDRESSES INTERNSHIP SHORTAGES.</b> .....	<b>75</b>
FORM E: DECLARATION OF CO-AUTHORED PUBLICATION CHAPTER .....	77
4.1 INTRODUCTION TO THE MANUSCRIPT .....	79
4.2 PUBLICATION 1 .....	81
4.3 CONTRIBUTION OF THIS MANUSCRIPT.....	83
<b>CHAPTER 5: AGED CARE FACILITIES AND PRIMARY HEALTH-CARE CLINICS PROVIDE APPROPRIATE SETTINGS FOR DIETETICS STUDENTS TO DEMONSTRATE INDIVIDUAL CASE MANAGEMENT CLINICAL COMPETENCE.</b> .....	<b>85</b>

FORM E: DECLARATION OF CO-AUTHORED PUBLICATION CHAPTER .....	87
5.1 INTRODUCTION TO THE MANUSCRIPT .....	89
5.2 PUBLICATION 2 .....	91
5.3 CONTRIBUTION OF THIS MANUSCRIPT.....	101
<b>CHAPTER 6: CREDIBLE AND DEFENDABLE ASSESSMENT OF ENTRY-LEVEL CLINICAL COMPETENCE: INSIGHTS FROM A MODIFIED DELPHI STUDY.....</b>	<b>105</b>
FORM E: DECLARATION OF CO-AUTHORED PUBLICATION CHAPTER .....	107
6.1 INTRODUCTION TO THE MANUSCRIPT .....	109
6.2 PUBLICATION 3 .....	111
6.3 CONTRIBUTION OF THIS MANUSCRIPT.....	127
<b>CHAPTER 7: COMPETENCY-BASED ASSESSMENT FOR CLINICAL SUPERVISORS: DESIGN-BASED RESEARCH ON A WEB-DELIVERED PROGRAM .....</b>	<b>129</b>
FORM E: DECLARATION OF CO-AUTHORED PUBLICATION CHAPTER .....	131
7.1 INTRODUCTION TO THE MANUSCRIPT .....	133
7.2 PUBLICATION 4 .....	135
7.3 CONTRIBUTION OF THIS MANUSCRIPT .....	149
<b>CHAPTER 8: DISCUSSION.....</b>	<b>151</b>
8.1 INTRODUCTION .....	151
8.2 THE CURRENT HEALTHCARE CONTEXT.....	151
8.3 RESEARCH OUTCOMES .....	152
8.4 THE ALIGNMENT OF CLINICAL EDUCATION WITH FUTURE WORKFORCE DEMANDS .....	155
8.5 SHIFTING THE FOCUS OF ASSESSMENT .....	170
8.6 WEB-BASED EDUCATION FOR CLINICAL SUPERVISORS .....	184
<b>CHAPTER 9: RECOMMENDATIONS FOR PRACTICE ARISING FROM THESE DOCTORAL STUDIES .....</b>	<b>195</b>
9.1 RECOMMENDATIONS FOR PLACEMENT CURRICULA.....	195
9.2 CLINICAL PLACEMENT PREPARATION AND DELIVERY .....	196
9.3 COMPETENCY-BASED ASSESSMENT PRACTICES .....	198
9.4 WEB-DELIVERED EDUCATION TO SUPPORT CLINICAL EDUCATION .....	202
9.5 RECOMMENDATIONS FOR FURTHER RESEARCH .....	203
9.6 STRENGTHS AND LIMITATIONS OF THE RESEARCH .....	204
9.7 CONCLUSION .....	208
<i>The Contribution of this Research</i> .....	211
<b>BIBLIOGRAPHY.....</b>	<b>213</b>
<b>APPENDICES .....</b>	<b>263</b>
APPENDIX 1 OPERATIONAL DEFINITIONS .....	263
APPENDIX 2 NEW COMPETENCY STANDARDS (DAA 2015d) .....	254
APPENDIX 3 ETHICS APPROVAL.....	269
APPENDIX 4 FULL DETAILS OF PHASE 1 STUDIES 1-3 .....	271
APPENDIX 5 REVISED INDIVIDUAL CASE MANAGEMENT CLINICAL PLACEMENT MILESTONES.....	295
APPENDIX 6 A WEB-BASED PROGRAM TO PREPARE STUDENTS FOR THEIR HOSPITAL ICM PLACEMENT.....	309



## List of Tables

Table 1.1	Research Phases, Related Chapters and Publications
Table 2.1	The Model of Skills Acquisition
Table 2:2	Structure of the Dietitians Association of Australia (DAA) National Competency Standards for Entry-Level Dietitians (2009)
Table 2.3	Dietitians Association of Australia Unit 4 Elements of Competence and their Related Performance Criteria (2009)
Table 3:1	Overview of the Methods Used to Answer the Research Aims
Table 3:3	Definitions of the SERVQUAL Dimensions.
Table 5:1	Dietitians Association of Australia Unit 4 Elements of Competence and their Related Performance Criteria (2009)
Table 5:2	Use of Non-Hospital Placement Settings for ICM Clinical Placements
Table 5:3	Elements of Competence with Dissent
Table 6.1	The Modified-Delphi Study
Table 6:2	Global Ratings of Student Performances
Table 6:3	Qualities used by Supervisors to Discern Entry-Level Performance
Table 7:1	Formative Feedback and Subsequent Refinement to the Program
Table 7:2	Data Generated from <i>Feed our Future</i> : Participation
Table 7:3	Data Generated from <i>Feed our Future</i> : Pre-test Results Q2
Table 7:4	Data Generated from <i>Feed our Future</i> : Pre-test Results Q3
Table 7:5	Constructivist Design Supports Transformative On-line Learning.
Table 7:6	Program Features: Barriers and Solutions
Table 7:7	Learning Content included in <i>Feed our Future</i>
Table A4:1	Study 1 Patient Demographics SERVQUAL Survey
Table A4:2	SERVQUAL Results for 31 Ambulatory Clients using the SAS

## List of Figures

- Figure 1 A Conceptual Diagram Developed for this Thesis
- Figure 2:1 Millers Pyramid of Clinical Assessment
- Figure 2:2 Millers Pyramid of Clinical Competence
- Figure 2.3 Factors Influencing Performance
- Figure 2:4 Schematic Representation of the Stages in Professional Growth: Mastery of a Discipline and Professional Development along a Continuum from Novice to Expert
- Figure 2:5 An Example and the Relationship of a Unit of Competency, Element of Competency and Related Performance Criteria from the DAA National Competency Standards for Entry-Level Dietitians (2009)
- Figure 5:1 The Dietitians Association of Australia National Competency Standards for Entry Level Dietitians In Australia (2009)
- Figure 5:2 Dietetics Placement Mapping Questionnaire (DPMQ)
- Figure 6:1 Global Assessment of Competency use for Assessment Questionnaire
- Figure 6:2 Behavioural Descriptors of Student Competency
- Figure 7:1 Visual Representation of Competency Development using Videos
- Figure 7:2 Final Interface Home Page
- Figure 7:3 Final Interface Learning Modules
- Figure 7:4 Final Interface Practice Modules
- Figure A6.1A Program Interface – Home Page
- Figure A6.1B Program Interface – Module 1
- Figure A6.1C Program Interface – Module 2
- Figure A6.1D Program Interface – Module 3
- Figure A6.1E Program Interface – Module 4
- Figure A5.1F Program Interface – Capstone Unit

## Abbreviations

AHPRA	Australian Health Practitioners Regulation Agency
ALHW	Australian Institute of Health and Welfare
APD	Accredited Practising Dietitian
CETQ	Clinical Education and Training Queensland
DAA	Dietitians Association of Australia
DINER	Dietetic Information and Nutrition Education Resources: a database provided by for members of the Dietitians Association of Australia
HWA	Health Workforce Australia
ICM	Individual Case Management
NHMRC	National Health and Medical Research Council
OSCE	Objective Structured Clinical Examinations
SAS	Student-Assisted Services
SOLO	Structure of the Observed Learning Outcome: Taxonomy developed by Biggs and Collins (1982)

## Acknowledgements

I would like to convey my gratitude to my supervisors, colleagues, family and friends for their support over my candidature. I cannot thank my supervisors, Professor Lauren Williams and Associate Professor Laurie Grealish enough for the way they have given so generously of their time and wisdom, and Maggie Jamieson for her support at the University of Canberra. I would like to thank Emeritus Professor Tony Butterworth, Dr Sue McAllister and Professor Sue Ash for their expert advice; the Reference Group Members - Dr Claire Palermo, Dr Paul Wilkinson, Dr Leanne Brown, Nerida Volker, Melissa Armstrong, Kate O'Brien, Margaret Thornton, Laura Thompson and Jacinta Dugbaza for their advice with the national study; the participants in my research including the panel of experienced clinical supervisors – Sam Thompson, Ingrid Roche, Vivian Sloan, Lisa Barker, Elesa Crowley, Matthew Newby, Wendy Stuart-Smith, and Lydia Sutakowsky for their invaluable contributions; and Amy Haughey, Emma Agnew, Katie Cheng, Jeanette Ryan, Tracey Hawke, Amy Yeung and Jane Kellett for their assistance with the research. I would like to acknowledge the financial support provided through my Health Workforce Australia National Clinical Supervision Fellowship and the in-kind support through the University of Canberra as a PhD candidate. I would like to thank Patrick Brady for his technical assistance. Finally and most importantly, I would like to thank my mother Pru for her support, editing and proofreading assistance; and my children James and Eloise for their love and patience during my candidature.



An Australian Government Initiative

This project was possible due to funding made available by Health Workforce Australia.

## Preface

The qualitative research included in this thesis considers the lived experiences of the participants. To ensure a robust research design, the influence of the researcher on the data collection and interpretation must be considered. Reflexivity requires self-awareness by the researchers of their own experience and perspectives (Yin 2011).

I have worked as an academic teaching in the Masters of Nutrition and Dietetics program since 2010. In this role, I am responsible for the clinical placement program, including the establishment of the Student Assisted Services. Prior to my appointment, I worked as a dietitian for 15 years predominantly in the clinical field and for the last seven of those years specifically in clinical education. I know all the students and many of the dietitians who participated in this research. Health Workforce Australia (HWA), which has an interest in facilitating placements in underserved areas, provided Fellowship funding for the establishment of the web-based assessment tool and both Phases 2 and 3 of my research.

There is therefore a risk of potential subjectivity in data collection and interpretation. By understanding this risk, I have taken care to ensure that other researchers have independently verified the results of the research. It is only by accurately understanding the experiences of the participants that I can gain sufficient insight to make modifications to the Student Assisted Services, assist supervisors to achieve more credible and defensible assessments and improve the delivery of programs such as *Feed Our Future*. This depth of understanding and insight has allowed me to genuinely make a difference to clinical placement outcomes, benefiting not only the students but also the dietetics profession as a whole.

Table 1.1 provides an overview of the research phases, research aims, related thesis chapters and publications.

**Table 1.1 Research Phases, Related Chapters and Publications**

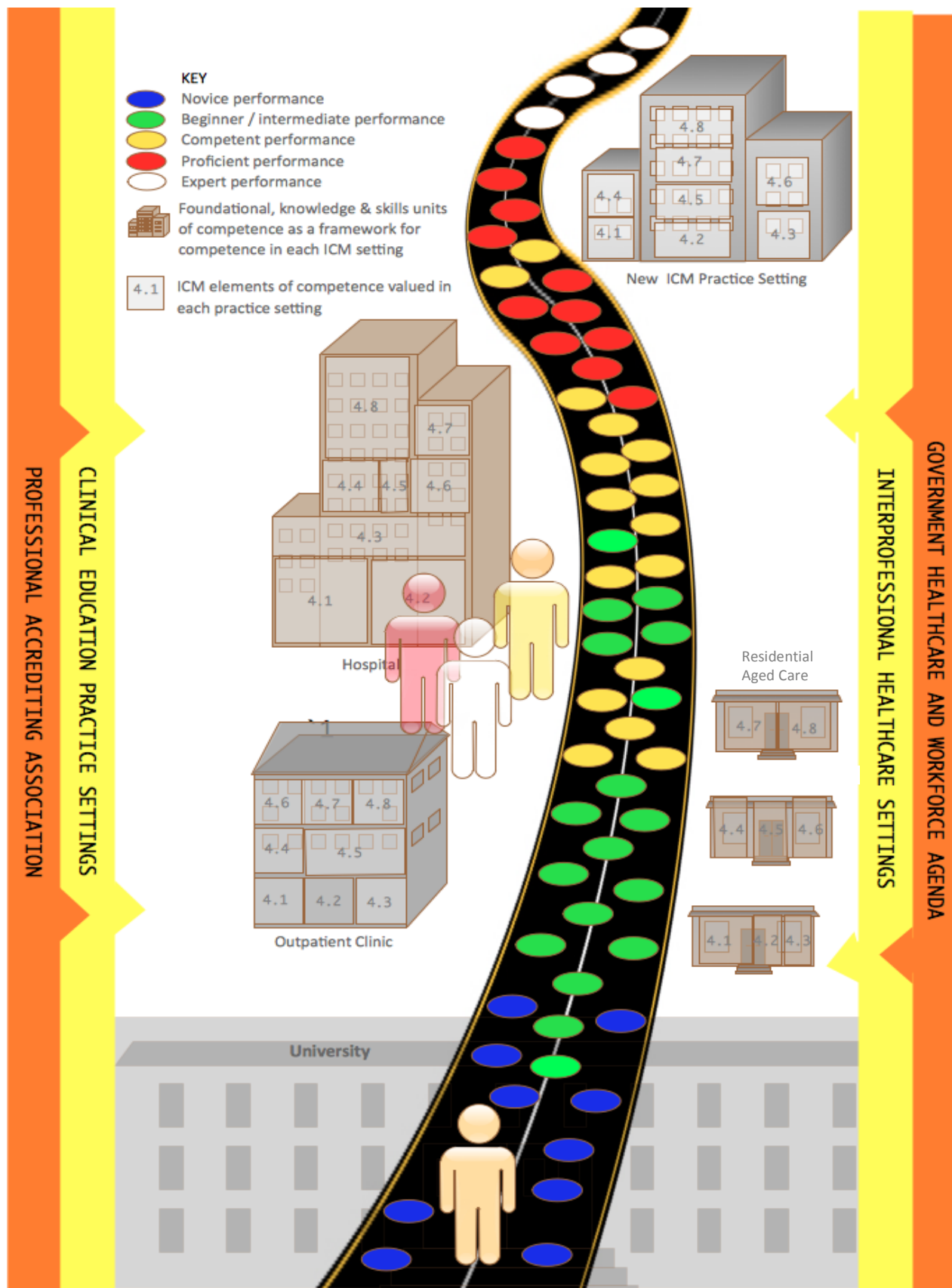
Research Phase	Thesis Chapter	Publication
<p><b>Phase 1</b> Aim (1): To evaluate the experiences and service satisfaction of stakeholders involved with health services outside the hospital setting that provide ICM placements for student dietitians.</p>	4	<p><b>Bacon, R, Williams, L, Grealish, L, Jamieson, 2015, 'Student-Assisted Services (SAS): An Innovative Clinical Education Model that Prepares Graduates for the Future, Contributes to Health Service Delivery and Addresses Internship Shortages' <i>Journal of the Academy of Nutrition and Dietetics</i>, vol.115; 351-352.</b></p>
<p><b>Phase 2</b> Aim (2): To identify the extent to which Australian tertiary dietetics programs are using settings outside the hospital for ICM placements.</p>	5	<p><b>Bacon, R, Williams, L, Grealish, L 2015, 'Nursing Homes and Primary Health Care Clinics Provide Appropriate Settings for Student to Demonstrate Individual Case Management Clinical Competence' <i>Nutrition and Dietetics</i>, vol.172, no.1, pp. 54-62.</b></p>
<p><b>Phase 3</b> Aim (3): To explore the development of ICM competencies in placements outside the hospital setting.</p>	6	<p><b>Bacon, R, Williams, L, Grealish, L, Jamieson, M 2015 'Credible and Defensible Assessments of Entry-Level Clinical Competence: Insights from a Modified Delphi Study', <i>Focus on Health Professional Education</i>. Accepted for publication 12<sup>th</sup> January 2015.</b></p>
<p><b>Phase 4</b> Aim (4): To apply the research from Phases 1 to 3 to develop a web-based program to support clinical supervisors in assessment of student dietitian performances in a range of ICM settings.</p>	7	<p><b>Bacon, R, Williams, L, Grealish, L, Jamieson, M 2015 'Design-based research on a web-based program in competency-based assessment for clinical supervisors', <i>JMIR Research Protocol</i>, vol. 4, no. 1, pp. e26.</b></p>

Figure 1 provides a conceptual diagram for this thesis. University dietetics programs are required to conform to the clinical placement requirements set out by the relevant professional accrediting body (Dietitians Association of Australia (DAA) 2011). In the profession of dietetics, universities must seek to provide students with clinical education experiences that enable them to develop competence (Daelman et al. 2004; Maher et al. 2014) as described by the competency standards of the DAA (2009). Based on the Dreyfus and Dreyfus Model of Skills Acquisition (1980) (applied to the health setting by Benner 1984), competence is not a line that must be crossed - rather it is part of a journey of learning, represented in the diagram in Figure 1 by the paved road.

This thesis posits that placement programs should be informed by government healthcare and workforce agendas (Department of Health (DoH) 2014; HWA 2011), as represented by the orange and yellow borders that frame this image. Providing students with Individual Case Management (ICM) placements in a range of settings, presented in this diagram by the buildings, is likely to produce graduates who are flexible and who possess a good understanding of the continuum of care (Phase 2 Study 4; presented in Publication 2; consistent with Merritt and Boogaerts 2014) and may assist in redistributing the workforce to areas that are currently underserved (Dalton 2008; Jones et al. 2014; Kondalsamy-Chennakesavan et al. 2015).

ICM placements outside the hospital setting can provide appropriate experiences for students to develop and demonstrate competence (Phase 2 Study 5; presented in Publication 2, consistent with Lordly & Taper 2008; Owen et al. 2013; Sheepway et al. 2014; Worley et al. 2006). Such placements, for example in outpatient clinics and residential aged care facilities,

Figure I - A Conceptual Diagram Developed for this Thesis





can provide opportunities for student dietitians to develop and demonstrate the ICM competencies (Phase 2 Study 5; presented in Publication 2; consistent with DAA 2010; Lordly & Taper 2008) represented by the rectangles on the front of each building. To perform successfully, students also need to ‘bring into play’ the dietetics skills and foundational competencies (Ash & Phillips 2000; DAA 2009), represented by the ICM building framework.

Innovative models of clinical education, such as the ‘*Student-Assisted Services*’, provide students with opportunities to work in emerging areas of practice, potentially extending professional boundaries, while at the same time contributing to healthcare delivery (Phase 1 Study 1-3 presented in Publication 1, consistent with Clinical Education and Training Queensland (CETQ) 2011; Dancza et al. 2013; Grealish et al. 2013; Gat & Ratzon 2014; Kassam et al. 2013).

The development of competence is context dependent (Johnson & Hager 2014). Different settings inevitably value different competencies to differing degrees (Phase 2 Study 5; Publication 2, consistent with Ash & Phillips 2000; Merritt & Boogaerts 2014). For example, the outpatient setting favours the element of competency 5.4 (Client-centred counselling), while the aged care setting favours the element of competency 4.1 (Malnutrition screening and assessment). This is represented on Figure 1 by the varying sizes of the rectangles on the ICM buildings. Clinical experiences provided outside the hospital setting support the development of competencies that are highly valued by the future workforce such as behavioural change techniques and flexibility (Rhen & Bettles 2012).

The learning journey of a student is not always linear or systematic, but rather is influenced by his/her placement experiences (Lave & Wenger 1991), as represented by the coloured pavers in the figure. Even a proficient practitioner may regress to a competent level of performance when commencing in a new practice setting (Ash & Phillips 2000). When a student begins a placement at a type of site that is different to a preceding placement, she/he may not immediately be able to recognise the similarities between the two settings and apply her/his prior learning (Merritt & Boogaerts 2014). Through reflection (Schön 1995) and scaffolding (Vygotsky 1962, applied to clinical education by Webb et al. 2009), students can transform their learning, create new knowledge and develop their competence in the new context (Larsen-Freeman 2013). Clinical supervisors (represented by the orange [competent], red [proficient] and white [expert] figures) ideally play a role in scaffolding student learning during placements (Phase 2 Study 5; presented in Publication 2).

This thesis makes a case that competency-based assessment during ICM placement is inherently subjective and that notions of credibility and defensibility, rather than validity and reliability, should be used to describe such assessment (Phase 2 study 5; presented in Publication 3; supported Schuwirth & van der Vleuten 2003). Clinical supervisors currently play key roles in assessing student competence (Phase 2 Study 4; presented in Publication 2). Assessors need to be supported to make quality judgements. Multiple sources of evidence need to be collected over the duration of a placement in a variety of cases and in a range of settings and considered in making the assessment (Ash & Phillips 2000; Schuwirth & van der Vleuten 2003). A global, rather than a checklist approach, should be used (Govaerts et al. 2002), and the learning context considered in the assessment (McAllister et al. 2011).

Web-based professional development programs, such as *Feed Our Future*, can support clinical supervisors to develop more credible and defensible approaches to competency-based assessment (Phase 3 Study 6; presented in Publication 4). Visual representations of authentic consultations using audio-visual recordings considered by an ‘*interpretive community*’ [represented in the figure by the supervisors figures arranged in a ‘community’] can support a shared understanding of entry-level performance and ‘*consensus*’ in assessments (Phase 2 Study 5; presented in Publication 3, consistent with Govaerts & van der Vleuten 2013).

This research has implications for both ICM placement programs and assessment practices. It supports the expansion of ICM placements to settings outside the hospital and the use of innovative models of clinical education in underserved areas. This thesis challenges current assessment practices and encourages a move towards a mixed-method approach to assessment, where competence is determined by a panel of trained assessors from a ‘*saturation*’ of evidence.

### Thesis Outline

This thesis is submitted as a series of chapters and journal publications that are drawn together into a coherent body of work. Chapter 1 considers the current healthcare context, articulating the rationale for the research. Chapter 2 provides a scholarly review of the literature on the use of placements for the development of clinical competence and competency-based assessment with specific application to the dietetics profession.

Chapter 3 presents the methodological background to the thesis. This includes the pragmatist framework, where rather than a philosophical perspective, the research questions determine the methods selected for the studies. This research values multiple perspectives and therefore adopts a mixed-methods approach. This includes a case study (Phase 1); a national online survey (Phase 2), a three-round modified-Delphi study (Phase 3); and a design-based research study that supports the concurrent advancement of design, research and practice in the development of a web-based program for clinical supervisors (Phase 4). Focus groups and personal interviews are used in Phases 1, 3 and 4 supporting a more in-depth exploration of the issues.

Chapters 4 to 7 present the findings of each research study in the form of a journal article. Published works are presented as portable document formats in the form in which they were published. As each manuscript is designed to stand-alone, there is an inevitable degree of overlap in the manuscripts. Each manuscript is briefly introduced and discussed within the chapter. Chapter 8 includes a commentary paper that brings these works together as an integrated whole.

In the final chapter (9) the conclusions and recommendations of all the published works are summarised, clearly articulating the new contribution made by this research to knowledge and practice in the area of dietetics clinical education. This section addresses the strengths and weaknesses of the studies and areas for further research. A complete reference list (including all references cited in the manuscripts) is provided at the end of the thesis, before the Appendices. Operational definitions for all terms used in this research are presented in Appendix 1.