FEED OUR FUTURE

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

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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) explores 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
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 underserviced 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 mixed-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.
Published manuscripts


Presentations with peer reviewed abstracts


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.


Awards


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.


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<th>Description</th>
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<tbody>
<tr>
<td>AHPRA</td>
<td>Australian Health Practitioners Regulation Agency</td>
</tr>
<tr>
<td>ALHW</td>
<td>Australian Institute of Health and Welfare</td>
</tr>
<tr>
<td>APD</td>
<td>Accredited Practising Dietitian</td>
</tr>
<tr>
<td>CETQ</td>
<td>Clinical Education and Training Queensland</td>
</tr>
<tr>
<td>DAA</td>
<td>Dietitians Association of Australia</td>
</tr>
<tr>
<td>DINER</td>
<td>Dietetic Information and Nutrition Education Resources: a database provided by for members of the Dietitians Association of Australia</td>
</tr>
<tr>
<td>HWA</td>
<td>Health Workforce Australia</td>
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<tr>
<td>ICM</td>
<td>Individual Case Management</td>
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<tr>
<td>NHMRC</td>
<td>National Health and Medical Research Council</td>
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<tr>
<td>OSCE</td>
<td>Objective Structured Clinical Examinations</td>
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<tr>
<td>SAS</td>
<td>Student-Assisted Services</td>
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<tr>
<td>SOLO</td>
<td>Structure of the Observed Learning Outcome: Taxonomy developed by Biggs and Collins (1982)</td>
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FEED OUR FUTURE: A pragmatist mixed-methods exploration of Individual Case Management (ICM) placements outside the hospital setting.
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 underserviced 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

<table>
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<th>Research Phase</th>
<th>Thesis Chapter</th>
<th>Publication</th>
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<td>Phase 2</td>
<td>5</td>
<td>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', <em>Nutrition and Dietetics</em>, vol. 72, no. 1, pp. 54-62.</td>
</tr>
<tr>
<td>Phase 3</td>
<td>6</td>
<td>Bacon, R., Williams, L., Grealish, L., Jamieson, M., 2015, 'Credible and Defensible Assessments of Entry-Level Clinical Competence: Insights from a Modified Delphi Study', <em>Focus on Health Professional Education</em>. Accepted for publication 12th January 2015.</td>
</tr>
</tbody>
</table>
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 underserviced (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,
FEED OUR FUTURE: A pragmatist mixed-methods exploration of Individual Case Management (ICM) placements outside the hospital setting.

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 (Johnnson & 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 underserviced areas. This thesis challenges current assessment practices and encourages a move towards a mixed-method approach to assessment, where competence is determine by a panel of trained assesses 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.
Chapter 1: Introduction and Research Rationale

With the ageing population and the rise in levels of chronic disease, health professional service demand is unlikely to be met using the current systems of care delivery (Nyland & Lafferty 2012). National health reform and health workforce development are required to meet the needs of the population (Health Workforce Australia (HWA) 2011). In Australia today, this would involve reallocation of the workforce to underserviced areas, such as aged care and chronic disease management (Brown et al. 2006; HWA 2011). Healthcare demand is driving a move towards a consumer-led integrated healthcare system that requires a multidisciplinary workforce with the flexibility to adapt to constant change (Bosanquet et al. 2006; Brownie et al. 2011; Nyland & Lafferty 2012). The ability to train more health workers is constrained, in part, by the capacity to provide sufficient clinical placement opportunities (HWA 2010). Development of innovative models of clinical education outside the hospital setting could increase clinical education capacity and may improve graduate preparation for future healthcare demands.

In Australia, the need for more dietetic input in aged care is clearly evident (Dietitians Association of Australia (DAA) 2012). On 30 June 2011, there were 169 000 Australians who received permanent residential care, with the majority requiring assistance with the activities of daily living (Australian Institute of Health and Welfare (AIHW) 2012). Within these facilities, studies have shown unacceptably high malnutrition prevalence rates of up to 50 per cent (Banks 2007; Gaskill et al. 2008). The number of places in residential aged care facilities is predicted to increase to 470 000 by 2050 (Australian Research Council Centre of Excellence in Population Ageing Research 2014).
Dietitians play a significant role in the management and prevention of the leading burdens of disease including cancer, cardiovascular disease, mental health and diabetes (National Health & Medical Research Council (NHMRC) 2013). Lifestyle and health behaviours including physical activity and nutrition are important determinants of disease risk (NHMRC 2013). Dietary risks are estimated to account for 11% of the total burden of disease in Australia (AIHW 2014). Nutrition counselling strategies (such as motivational interviewing, problem solving, goal-setting and self-monitoring), applied to change at-risk behaviours, have the potential to markedly lower the incidence of chronic disease and disability (Rhea & Bettles 2012).

The ability to train more health workers is constrained in part by a shortage in placements (White & Beto 2014). In Australia, there has been an increase in the number of student dietitians, driving the demand for supervised practice experiences. Nationally, the number of dietetic course completions in Australia in 2012 was 456 compared with 305 in 2007 (HWA 2014). This figure is expected to grow further, with an increase in the number of University programs and an increase in enrolments in existing programs (HWA 2014). In 1997, there were seven accredited dietetics programs in Australia (Phillips et al. 2000b). There are now 22 programs with provisional or full accreditation (this however includes six programs that are no longer accepting enrolments) and two additional programs with pending accreditation applications (DAA 2015a). Currently, the dietetic workforce is characterised by a higher proportion of less experienced dietitians and part-time employees (HWA 2014). This may reduce the number of eligible clinical supervisors. According to the DAA Accreditation
Manual, a primary placement supervisor must have at least two years experience in the relevant practice context (DAA 2011).

It is well established that supervised practice plays a key role in the development of competence in health professionals, enabling students to bridge the gap between theory and practice (Daelman et al. 2004; Maher et al. 2014). The Dietitians Association of Australia (DAA 2011) requires student dietitians to complete a minimum of 20 weeks (800 hours) of placements across the three main employment domains of food service management, community and public health nutrition, and individual case management (ICM). During ICM placements, student dietitians are required to apply the nutrition care process in an individualised clinical care context using medical nutrition therapy (DAA 2011). Ten weeks (400 hours) of placements is dedicated to the development of ICM competence (DAA 2011). DAA (2011) mandates that four weeks of this time should be completed in a hospital with more than two full time dietitians, but the remaining six weeks could be completed outside this setting.

While unstudied, it is predicted that most university programs rely on the hospital sector to provide most, if not all, the ICM experiences for their students. The high reliance on hospital placements could be due to the origins of the profession in this setting (Nash 1989). With patients who have increasingly complex needs and shorter lengths of hospital stay, work demands on clinicians in hospitals are increasing (Ferguson et al. 2014; White & Beto 2013). Placements further increase the demands on hospital dietitians. A recent study by Rodgers and colleagues (2012) found that while supervising occupational therapy or dietetics students, clinicians held longer consultations with patients and had reduced productivity in other areas.
of their practice. While some universities may provide some financial support to placement sites to offset these costs, financial compensation varies across academic institutions and professions (Ferguson et al. 2014; Rodgers et al. 2012).

Clinical supervision has traditionally been provided using an apprenticeship model with one-on-one supervision (Goldhammer et al. 1980). A collaborative learning model, defined as, ‘a clinical model of teaching in which two or more students are assigned to one clinical educator’ (Briffa & Porta 2013; p.564) has been used to increase clinical placement capacity. Collaborative learning models include team-teaching (Wagstaff 1989), problem-based learning (Winter et al. 2002) and co-operative or peer teaching (Roberts et al. 2009). In their systematic review of collaborative learning models Briffa & Porter (2013) found that collaborative learning models improve student self-reflection, confidence and participation, and reduce a student dependency on the educator. Within the Australian dietetic profession collaborative learning models have only been used in the hospital context (Ferguson et al. 2014; Roberts et al. 2009; Wagstaff 1989; Winter et al. 2002). Lynam and colleagues (2014) however, have recently pilot-tested a collaborative learning model for use in an outpatient setting and found it to be successful.

Areas of growth in the dietetics workforce are outside the acute care setting in aged care, private practice and wellness programs (Brown et al. 2006; Rhen & Bettles 2012). In 2011 1759 dietitians worked in hospital-based positions compared to 4325 in other health services (HWA 2014). New graduate dietitians have traditionally obtained their first positions in hospitals, but are increasingly starting their employment in sole practitioner positions in private practice or rural settings (Ash et al. 2011). These positions require clinical
compentence to be demonstrated in a range of contexts, often with limited professional support (Brown et al. 2010). Due to the emphasis on the hospital setting during ICM placements, new graduates may not be adequately prepared for work in non-hospital settings.

Placements outside the hospital setting would increase ICM placement capacity and may better align graduates to the needs of the future workforce. Results from other health disciplines suggest that students are able to achieve comparable learning outcomes in both acute and community settings (Owen et al. 2013; Worsley et al. 2006). Research from medicine and nursing also suggests that health students are equally satisfied with their placement experiences in hospital and community settings (Bjork et al. 2004; Gat & Ratzon 2014; Murphy et al. 2012). Students are more likely to take up employment opportunities in underserviced areas in community, aged care and rural settings, when they have had experiences in these settings on placement (Jones et al. 2014; Kondalsamy-Chennakesavan et al. 2015; McCall et al. 2009). Placements in residential aged care facilities have the capacity to produce graduates with a greater understanding of ageing and aged care (Grealish et al. 2013). Placements in settings that provide individual care in the community can facilitate a more holistic and client-centred approach to care and a better understanding of referral pathways (Crampton et al. 2013; Merritt & Boogaerts 2014).

Models of education where students are responsible for care delivery [such as student-led services (CETQ 2011; Grealish et al. 2013; Meek et al. 2013) and role emerging placements, where students are placed within an organisation where there is currently no health professional from with their discipline employed (Dancza et al. 2013; Gat & Ratzon 2014; Kassam et al. 2013), increase clinical education capacity and address workforce shortages in
primary health, aged care and rural settings (Dang et al. 2012; Ellett et al. 2010; Palombaro et al. 2011; Simpson & Long 2007). The idea of students contributing to service delivery through clinical training is not new. In the United States, student-led clinics deliver healthcare in underserviced areas (Buchanan & Witlen 2006; Clark et al. 2003; Ellett et al. 2010; Moskowitz et al. 2006; Palombaro et al. 2011). Simpson and Long (2007) reported that student-led services provided over 36 000 consultations annually. Such clinics however, differ from the Student Assisted Services presented in this research in that they are usually delivered pro-bono; student participation is voluntary and the services operate under limited supervision (Simpson & Long 2007). This would not meet the supervised practice hours required for professional credentialing. A paid supervision model has been trialled in Australia by other disciplines to support students to provide supervised care in clinical settings outside the hospital (Allan et al. 2010; Burrows et al. 2013; CETQ 2011; Copley et al. 2007; Grealish et al. 2013) but is yet to be research in the Australian Dietetics profession.

A practice hierarchy has been identified in dietetics (Lordly & Taper 2008) and other health disciplines (Bjork et al. 2014) where the perception exists that the ‘gold standard’ for clinical training is to situate placements in the acute care hospital setting (Lordly & Taper 2008). Rather than comparing practice settings with each other, there is merit in valuing the contributions of different practice environments. The addition of placements outside the traditional settings, using innovative approaches to clinical education may enable students to extend professional boundaries and adapt to the changes required by the future healthcare context. This thesis considers the use of ICM placements outside the traditional hospital setting. It aims to: (1) explore the experiences of key stakeholders; (2) identify Australian tertiary clinical placement practices; (3) explore student dietitians’ development of clinical competence; and (4) support supervisors in their competency-based assessment practices.
Chapter 2: Literature Review

This chapter provides a review of Australian and international literature on competency-based assessment during placements with application to the dietetics profession. The review: (1) positions 'Dietetics' as a profession; (2) explores different definitions of 'competence' and the use of the term in dietetics; (3) seeks to understand how students develop competence during placements; (4) provides an overview of assessment with consideration given to the assessment of competence; (5) provides a case example of the development and use of competency standards in the dietetics profession; (6) considers the challenges of competency-based assessment in the workplace: and (7) training assessors in competency-based assessment. This literature review will consider these seven aspects to provide a foundation to enable the exploration of placements outside the hospital setting and the potential for student dietitians to develop and demonstrate competent ICM performance in these settings with a focus on the Australian context.

2.1 The Professions

The term 'profession' is reserved for vocations that require specialist expertise and provide a recognised and ethical service to society (Marais et al. 2012). Historically, the term was reserved for the professions of theology, law and medicine (Weldon 2009) but now is used more broadly to include occupations that have attained government-legitimated autonomy over their work practices. According to the trait approach, reflecting functionalist theory, the status of profession can be acquired by developing the following traits: (1) a professional association and accreditation of members; (2) adopting a code of conduct and standards of ethical practice; and (3) setting a university degree as a minimum requirement of entry (Germov 2005).
The Australian Association of Dietitians was established in 1976 and became known as the Dietitians Association of Australia (DAA) in 1983. It currently comprises more than 5700 members (DAA 2015b) who agree to abide by the DAA’s Code of Professional Conduct (DAA 2013a) and Statement of Ethical Practice (DAA 2013b). Currently, in Australia dietitians must complete a university qualification at a Bachelor or Masters level (DAA, 2015c). The DAA’s Scope of Practice Framework (2014) states that:

The profession of dietetics contributes to the promotion of health and the prevention and treatment of illness by optimising the nutrition of populations, communities and individuals. Dietitians have a defined and recognisable body of knowledge and utilise science principles and methods in the study of nutrition and dietetics, applying these results to influence the wider environment affecting food intake and eating behaviour (Approved by the DAA Board July 2013, DAA 2014, p.2).

The Medicare Benefits Scheme was introduced into Australia in 1975, providing public health insurance for medical and hospital treatments. The Australian Commonwealth and State Governments recognised the allied health occupations as professions in 2004 when rebates became available for allied health services, including dietitians, as part of a multidisciplinary service, to assist in the management of chronic disease (Williams 2005). Rebates were later also made available for people of Aboriginal and Torres Strait Islander descent and for group programs for people with type 2 diabetes (DoH 2013). The Department of Veterans Affairs also funds access to dietetics services for current and former armed services personal who meet specified criteria (Department of Veteran Affairs 2015). Most private health funds in Australia offer rebates for dietetic services (DAA 2015d).
On 1st July 2010, the Australian Government established the Australian Health Practitioners Regulation Agency (AHPRA), which is responsible for the registration of 14 health professions, in partnership with their professional boards, including medicine and nursing (AHPRA 2015). The role of AHPRA includes the regulation of accreditation standards and entry requirements, and the oversight and monitoring of continuing professional development. The service charter states the key role is to protect the public and facilitate access to quality health services (AHPRA 2015). The dietetics profession was not included in AHPRA and remains outside this organisation, despite having lobbied for inclusion. Together with eight other allied health professions, dietetics has retained its autonomy and is self-regulated (Allied Health Professions Australia 2012). The Accredited Practising Dietetics (APD) program, conducted by the DAA (DAA 2015d), supports continuing professional development, mentoring and quality practice (DAA 2015d). Medicare, the Department of Veteran Affairs (2015) and most private health funds require evidence of APD status for patients seen by a dietitian to be eligible to apply for service rebates (DAA 2015d).

Whether regulated by AHPRA or self-regulated, professions require standards of competence to determine professional membership and to develop and accredit university program curricula. Competency standards provide professions with criteria to: (1) develop the curricula for tertiary training courses and externally validate the quality; (2) ensure professional practice standards and continuing professional development; (3) assess entry level performance of practitioners; (4) articulate to government and other employers the expectations of performance; and (5) maintain professional reputation with key stakeholders such as Medicare and the DVA (AHPRA 2015).
2.2 What is Competence and How is it Defined in Dietetics?

Despite the widespread use of the concept, there is no single definition of competence (Brownie et al. 2011). This results in confusion and inconsistencies in the application of competency-based assessment practices (Sheepway et al. 2014). The Macquarie Dictionary (Weldon 2009) defines competent as ‘properly qualified’ or ‘capable’ and most definitions agree that competence is required for individuals to function successfully in the workplace (Hager & Gonczi 1996; Jones 1999; Miller 1990). Differences in definition generally relate to the scope of the term, the influence of context on the development and assessment of competence, and the relationship between competence and performance.

A behaviourist view of competence is evident in the Vocational Education and Training sector (Watson 1993). This view sees competence as a binary concept, consisting of ‘competent’ and ‘not yet competent’ (Watson 1993), where competence is a product or end-point achieved through the demonstration of a set of discrete, easily measurable observable tasks (Norris 1991). The implications of this definition are that (1) tasks are viewed in isolation rather than together as an integrated whole (Sheepway et al. 2014); and (2) broader aspects of job performance such as planning or reacting to contingencies are not considered (Hager & Gonczi 1996). This approach is associated with a ‘tick-box’ or reductionist approach to assessment (McAllister et al. 2011).
Miller (1990) in his model of clinical assessment defines competence as ‘knowing how’; ‘the intellectual skills with which knowledge is applied or the technical skills with which diagnostic and therapeutic procedures are carried out’ (Miller 1990, p. s64, see Figure 2.1).

Figure 2.1 Millers Pyramid for Clinical Assessment (Miller 1990, p. s63).

This definition appears consistent with a behaviourist approach and has influenced how competence has been assessed within some health disciplines such as nursing and medicine (McAllister et al. 2011). Miller’s model however, clearly articulates that competence (when defined this way) cannot be assumed to predict actual work performance or action (Miller 1999). Wass and colleagues (2001, see Figure 2.2) have renamed Miller’s pyramid as an ‘Assessment framework for clinical competence’ recognising the need to assess all stages shown to measure competent clinical performance.
A generic definition of competence posits it as a series of graduate attributes such as communication, problem solving and pattern recognition (Norris 1991). Competence here is seen as a psychological construct that emphasises affective and cognitive skills (Sheepway et al. 2014). One difficulty with this approach is: (1) health professionals, like all occupations, require the performance of some relatively specific tasks (Gonczi & Hager 1996); and (2) generic skills, without reference to context, are unlikely to predict actual work performance (Johnnson & Hager 2008).

The holistic definition of competence as proposed by Hager & Gonczi (1996) views competence as an integration or relationship between individual attributes (knowledge, skills and attitudes) together with the key tasks and job roles of the profession. This approach views competence as an intangible quality that reflects the capacity or capability of an individual to function successfully in a workplace (Brown 2000; Hager & Gonczi 1996). Possession of knowledge, including the more abstract notions of critical thinking and clinical reasoning, are encompassed within this perspective (McAllister et al. 2010). Brownie and Thomas (2014) who were commissioned to develop a career framework for the Australian
health workforce, have selected a definition of competence consistent with a holistic approach,

Competence [is] a generic term referring to a person’s overall capacity to perform a given role, including not only performance but [also] capability. It involves both observable and unobservable attributes such as attitudes, values and judgmental ability (p.217).

A holistic definition of competence was used for the development of the competency standards in the dietetics profession (Ash et al. 2011).

Finally, there is confusion in the literature about the relationship between performance and competence. Some authors (McAllister 2005; Rethans et al. 2002; Schuwirth et al. 2002) define competence as they way in which people perform under ideal conditions, and performance as how people behave in real life. Khan and Ramachandran (2012) however, incorporate the concept of ‘capability’ by dividing performance into ‘actual’ and ‘observed’ performance, where observed performance is a variable trait influenced by a multitude of factors including the observation of assessors (see Figure 2.3). They define competence as, ‘a point on the spectrum of improving actual performance’ (p.920), with reference to the Dreyfus and Dreyfus’ Model of Skills Acquisition (1980).

The Dreyfus and Dreyfus’ Model of Skills Acquisition (1980), applied to the health context by Benner (1984), has informed the way in which competence is defined in the dietetics profession (Academy of Nutrition & Dietetics 2013; Ash et al. 2011; Ash & Phillips 2000; Gilmore et al. 1997). In Benner’s model, competence is a mid-point on a continuum of
development from novice to expert (see Figure 2.4). This approach views competence as part of a journey of learning rather than a product or end-point (McAllister et al. 2010). It encourages students in their development, recognises the point at which they are safe to practice independently (Chambers et al. 1998), and allows for development towards excellence (Ash & Phillips 2000). Competence marks the point at which when an individual is able to continue their professional development independently (Ash & Phillips 2000). Within this construct, the development of competence is only just beginning at the time of graduation (Ash et al. 2011).
Figure 2.3 Factors Influencing Performance (Khan & Ramachandran 2012, p.921).
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 (American Dietetics Association 1997, p. 306).
2.3 The Development of Competence

Johnson and Hager (2008) suggest that the development of competence cannot be separated from the sociocultural context of the workplace. Each setting has its own organisational structure, ethics, and rules of engagement that need to be understood in order to participate successfully (Ash & Phillips 2000). Competence development is dependent on the interactions between the student and his or her experiences (Johnsson & Hager 2008).

Research by Levett-Jones and colleagues (2008) suggests that the relationship/s between the student and supervisor/s is the most important influence on the development of competence during placements.

The work of Vygotsky (1962) highlighted the importance of the relationship between teacher and learner. Vygotsky’s work centres on the development of children, but has been applied to adult learning in the context of clinical education (Webb et al. 2009). Development of competence by students can be facilitated by a ‘symbiotic relationship’ with their supervisors (Webb et al. 2009). Through discourse, the supervisor can make the practices and rules of the workplace explicit, providing the student with a sense of security and enabling participation (Maher et al. 2014). By selecting learning experiences within the ‘Zone of Proximal Development’ (Vygotsky 1962) of the student the supervisor can scaffold student performance, developing and extending the learning (Webb et al. 2009). This is consistent with the work of Eraut (2007) who found that in the workplace, both being over-challenged and under-challenged was detrimental to learning.
Workplace learning includes a ‘hidden curriculum’, whereby learners are influenced by values or behaviours of the organisational culture that do not align with the intended curriculum (Hafferty 1998). Research (Dancza et al. 2013; Kell 2014; Palermo et al. 2015b) suggests that students often feel compelled to perpetuate the practices of their supervisors even in the context of internal conflict. Anderson (1988) asks;

‘Is there something in this teaching aspect of supervision that makes a difference between clinicians who becomes clones of their supervisors and clinicians who are able to go beyond their supervisors and become the independent, autonomous clinicians that we profess to produce?’ (p.xiv).

Anderson has proposed a model of clinical supervision, further described by Brassuer (1989) that considers the degree of support or guidance required by learners to perform competently and most specifically, to self-evaluate. Students do not intuitively know how to self-evaluate, but rather this is developed through feedback and guidance from those who are already inducted into the culture and standards of the discipline (Boud 2010).

Optimal healthcare delivery requires a team-based (rather than an individualistic) approach to clinical practice, where practitioners are able to transform and create new knowledge adapting to ever changing work practices. Wenger’s concept of a ‘community of practice’ (1998) goes beyond the relationships between two individuals and considers learning as a collaboration and co-construction of knowledge. In this model the student is not an individual, but rather a member within the healthcare team. Within this construct, student learning is enhanced when they are invited to participate more fully in the ‘community’ (Sheenhan 2011). Through student participation, a sense of belonging and identity as a
health professional develops. Her/his participation, in turn, also transforms the community (Lave & Wenger 1991). The ‘community’ therefore becomes the learning resource and supports a flexible learning (as opposed to a teaching) curriculum (Mann 2011). In the Australian current healthcare context, it may be more appropriate to consider competence as collective, situated, transformative and expansive (Govaerts and van der Vleuten 2013).

Table 2.1 provides a summary of each of the stages of development within the Model of Skills Acquisition described earlier (Figure 2.4 - Dreyfus & Dreyfus 1980; Benner 1986).

Table 2.1 The Model of Skills Acquisition

<table>
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<th>Level</th>
<th>Description</th>
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| **Novice**  | Behaviour is inflexible and is driven by rules based on theoretical understandings  
                          All attributes and aspects are treated as equally important |
| **Advanced Beginner** | Principles are used to inform actions based on attributes or aspects of a situation  
                          Limited situational perception is evident  
                          All attributes and aspects are treated as equally important |
| **Competent** | Planning is long term, deliberate and used to determine the key aspects and attributes of a situation  
                          Problem solving using conscious, abstract and analytical considerations  
                          Planning is used to increase efficiency and organisation |
| **Proficient** | Maxims, informed by experience, are used for guidance  
                          Situations are seen holistically, identifying what is most important in a situation based on experience  
                          Decision-making is less laboured but will shift to an analytical approach in novel situations |
| **Expert**  | No longer relies on rules, guidelines or maxims  
                          Intuitive grasp of situations based on deep tacit understanding  
                          Analytical approaches are used only in novel situations, when problems occur or when justifying conclusions |

Source: Summarised from Dreyfus & Dreyfus 1980; Benner 1984
The Model of Skills Acquisition asserts that the development of expertise goes beyond the application of theory to practice in the complex intertwining of theory, clinical experience and judgment (both explicit and intuitive). The practitioner moves from: (1) being a detached observer to an involved performer; (2) identifying all aspects as equally important to identifying only what is directly relevant; and (3) relying on rules, principles and procedural thinking to using tacit knowledge and intuitive thinking to inform their judgments.

According to constructivist theory, learners construct their own meaning by forming connections between their prior knowledge and new experiences (authentic real-world problems), through collaboration and reflection (Biggs & Tang 2007). Within this paradigm, learners are thought to construct schemata that organise information into systems (Biggs & Tang 2007). In medical education, Schmidt and Rikers (2007) have suggested that students organise their schemata according to disease aetiologies as described by physiological processes. In the health setting, this knowledge is conceptualised as illness scripts (Schmidt & Boshuizen 1993; Schmidt & Rikers 2007), and then later organised into instance scripts that use contextual information as anchor points. Once practitioners develop expertise, this practice of pattern-recognition becomes rapid and effortless. The concepts of illness / instance scripts are helpful in that they explain how learning in a new clinical context is effortful and detailed but becomes easier with more experience in that setting.

Within Medicine, the concept of case-specificity has been proposed, suggesting that knowledge and skills cannot be transferred between clinical cases (Fitzgerald et al. 1994). More recent research has expanded this perspective, suggesting that both generic (transferable) abilities and case specific (non-transferable) abilities function together in
clinical problem solving (Wimmers et al. 2007; Wimmers & Fung 2008). Sheepway and colleagues (2014) however have criticised the concept of *case-specificity*, claiming that it is predominantly based on studies that use simulated assessment practices where students do not have access to the usual resources such as colleagues, textbooks and journals available in the workplace to aid their performance. An alternative view is that rather than transferring learning directly from one setting to another, learning is ‘transformed’ in the new context (Larsen-Freeman 2013; Sheepway et al. 2013), as described by Carraher & Schliemann:

Learners do not simply upload a prior solution from their storehouse of knowledge. They have crafted it on the spot, adjusting and adopting their prior knowledge process (Carraher & Schliemann 2002, p. 18).

This perspective aligns with a holistic definition of competence (Sheepway et al. 2014).

Learning transformation is most likely to occur when students engage in deep learning and their understandings are represented at an abstract level, which transcends the specifics of a particular context (Larsen & Feedman 2013). This enables them to recognise patterns or connections between the contexts (Pellegrino & Hilton 2012). This abstract level of thinking can be seen in the ‘*competent*’ stage of development in the Model of Skills Acquisition (Benner 1984; Dreyfus & Dreyfus 1980) and is still used by practitioners in the proficient and expert stages in novel or unfamiliar settings. In the early stages of novice and beginner procedural, rather than conceptual, thinking is evident. Learning transformation relies on the learner being motivated to engage with their experiences in two different placement contexts. This is dependent on the value he/she places on each placement setting (Larsen & Feedman 2013). An example of this is evident in the work by Grealish and colleagues (2013) where the lack of motivation to learn in the aged care placement exhibited by some students reflected
the strong collective identity of nursing as being located in a hospital, rather than in a community, setting.

Research by Sheepway and colleagues (2013) has shown that learning is cumulative across placement settings. If this is the case, the provision of a range of ICM settings not only supports students to apply their theoretical knowledge and develop the necessary knowledge, skills and attributes to become competent professionals, but also provides the opportunity for students to reflect, create new knowledge and transform their practice. This has the potential to develop workforce flexibility. This is consistent with the recommendations of Mann (2011), who argues that for the future of healthcare, clinical education needs to go beyond the ‘straightforward application of theoretical knowledge (p. 62)’ and equip professionals with the skills to develop new solutions for new problems; to develop competence in ‘how to learn’ as well as in ‘what to learn’.

2.4 Assessment and the Assessment of Competence in the Clinical Setting

Assessment, in the context of health professional education, is defined as, ‘any purported and formal action to obtain information about the competence and performance of a candidate’ (Schuwirth & van der Vleuten 2010, p.195). It involves making decisions about what is relevant evidence, how to collect and interpret the evidence and how to communicate it to its intended users (Harlen 2005). The two main purposes for assessment are:

(1) Assessment of learning (summative assessment) that involves a final decision or ‘summary’ of achievement and is used for credentialing purposes to determine ‘fitness for practice’ (Keating et al. 2009); and
(2) Assessment for learning (formative assessment) that is intended to inform the students of their progress, guiding their future development (Schuwirth & van der Vleuten 2011). Formative assessment also supports students to self-assess their own performance and provides feedback to educators (Boud 2010).

There is an inherent conflict between formative and summative assessment. For summative assessment, students aim to present only their achievements (Bings & Tang, 2007). For the optimal benefits of formative assessment to be realised however, students need to feel safe to make their learning deficits transparent to allow identification of their learning needs (Biggs & Tang 2007). Clinical supervisors also experience this tension in their dual roles of assessor and coach (Cavalcanti & Detsky 2011).

‘Assessment drives learning’ (Wass et al. 2001). It powerfully frames what and how students learn and is one of the most significant influences (both positive and negative) on students’ experiences and outcomes in higher education (Boud 2010).

Methods used to assess educational achievement convey powerful messages about the kinds of learning considered worthy of recognition and reward and so are capable of influencing educational processes in positive ways by focusing effort on valued achievements and forms of learning. Equally, however, assessment methods are capable of sending unintended messages and distorting student learning if they place inappropriate weight on less important goals or address only a narrow range of valued achievements (Masters 1999, p. 20).
According to the theory of ‘constructive alignment’ (Biggs & Tang 2007), clear ‘alignment’ between the learning outcome, learning experience and assessment task is required (Biggs & Tang 2007), through which students ‘construct’ their own learning. The Australian Qualifications Framework (2013) enforced by the Tertiary Education Quality and Standards Agency, emphasises the need for graduates to demonstrate verifiable achievements consistent with the generic learning outcomes required for each course level. Boud (2010) further suggests that assessment tasks should not only be used to enable judgements to be made about what has been learned, but also be significant learning experiences in their own right.

Bloom’s Taxonomy of Educational Objectives (1984), developed by educational administrators, has been used in tertiary education as an assessment guide. The taxonomy describes a hierarchical sequence of verbs with increasing levels of complexity that consider the learning domains of knowledge (cognitive), attitudes (affective) and skills (psychomotor). These have been used by educators to construct learning outcomes and have been revised and extended by others, most notably Anderson and Krathwohl (2001). Within the knowledge domain, remembering and understanding are preliminary to the application of knowledge, whereas analysing, evaluating and creating require higher-order cognitive skills. Research by McAllister and colleagues (2011) showed that when applied to clinical education complex cognitive skills, such as analysis and interpretation of quantitative and qualitative client data and development of clinical diagnoses, appeared to be the most difficult and took longer to develop. McAllister has argued that Bloom’s taxonomy does not consider ‘professional craft knowledge’ (as described by Benner 1984) nor does it capture the integration of knowledge, skills and attitudes required for clinical competence (McAllister 2005).
Biggs and Collins’ (1982) Structure of the Observed Learning Outcome (SOLO) taxonomy is more consistent with the assessment of clinical competence (McAllister 2005). This classification explores both the scope and quality of student learning, the student capacity to handle complexity and to transform learning across different contexts (McAllister et al. 2010). The taxonomy suggests that judgements on quality are made on the basis of student applies and integrates their learning (Biggs & Tang 2007). Assessment at the uni-structural and multi-structural level is primarily quantitative, whereas at the relational and extended abstract level it requires qualitative assessment (Biggs 1995). At the extended abstract level, the student is able to transform his/her learning to new contexts. A student transforming her/his ICM competence from a hospital to a community setting would be an example of this transformation.

There is no one specific definition of competency-based education in the literature, and competency-based frameworks often have little or no alignment across disciplines (Brownie & Thomas 2014). Millers’ Pyramid of Clinical Assessment (1990, Figure 2.1 introduced earlier p. 24) has been used in medicine as a framework to consider the alignment between the different facets of clinical competence from underlying knowledge and clinical skills to competent performance in simulated and actual work contexts (Wass et al. 2001, Figure 2.2 p.24). This approach to assessment underlines assessment strategies such as Objective Structured Clinical Examinations (OSCE) (Hawker & Walker 2010). A common theme in the clinical assessment literature is that assessment of competence and performance are separate entities (Boursicot et al. 2011; Rethans et al. 2002). Khan and Ramachandran (2012) in arguing against this premise posit that since competence is a point on the spectrum of actual performance rather than a separate entity, assessments from both simulated and actual work settings provide different contexts from which competence can be inferred. The
dietetics profession supports the assessment of competence in both simulated and workplace settings (Palermo et al. 2015a). The DAA accreditation manual states,

Students can achieve competency in a variety of settings and innovation is encouraged. However, placement activities need to provide students with an opportunity to demonstrate competence in the curriculum’s core activities. Some variety in the workplace or simulated environment is encouraged for the different placements (DAA 2011, p.12).

An understanding of the theoretical intentions of the competency standards and the actual practice application of the competency standards within the dietetics profession is required in order to meaningfully explore the potential for students to develop and demonstrate the ICM competencies in placement settings outside the hospital setting.

2.5 The Development of Competency Standards using Dietetics as a Case Example

Government agendas have influenced the development of competency-based assessment in Australia. In the late 1980s competency-based assessment was mandated in the vocational education sector by the Federal Government as part of their national training reform agenda (Harris et al. 1995). When education of enrolled nurses (those who work under the supervision of a registered nurse) was moved from the hospital to the vocational education sector, competency-based assessment became a part of the education of health professionals (Martin 1975). The tertiary education sector was more resistant to adopting competency-based assessment as it was seen as a threat to the scholarship and excellence unique to university education (Geffen 1992; Wilson 1992). Like many other health professions, the development of the competency standards for the dietetics profession occurred in response to
the immigration agenda of the Australian Government and was supported by funding from the National Office of Overseas Skills Recognition (Ash et al. 1992).

A taskforce was established in 1988 that included an academic dietitian from each State providing a dietetics program and the President of the DAA, to develop the first National Competency Standards for Entry-level Dietitians (Gonczi et al. 1993). National Office of Overseas Skills Recognition funding meant that the chief purpose of the competency-based standards was to assess whether dietitians trained overseas were safe to practice in Australia. Rather than relying on qualification based evidence National Office of Overseas Skills Recognition wanted a means of assessing actual performance in the workplace (Ash & Phillips 2000).

Dietetics was one of the first health professions to complete the competency development process and the methodology developed was published as a case study for use by other disciplines (Ash et al. 1992). A functional analysis methodology was used to define the competency standards by considering the overall purpose of the profession and employment roles. McAllister and colleagues (2010) are supportive of the functional analysis approach for the ability to fosters a holistic and integrated view of competence, seeing learning as a process rather than a product.

In most instances it has been the ‘experts’, removed from the practice setting, who have been responsible for the development of competency standards using methods such as focus groups, Delphi methods and stakeholder consultations (Grealish 2009). In the case of
dietetics the competency standards were developed by experts and refined through consultation with practicing dietitians, academics, union representatives and regulatory authorities. Validation of the competencies, however, was conducted using critical incident interviews with 26 recently graduated dietitians (six to 18 months post) (Ash et al. 1992). In Australia dietetics, nursing (Gardiner et al. 2006) and optometrists (Community Services and Health Industry Training Board, 2005) have collected data directly from practitioners about their core activities to inform the development and revision of their competency standards. This approach is not evident in dietetics in other countries (Ash et al. 2011).

The National Competency Standards for Entry-Level Dietitians were first implemented in Australia in 1993 (DAA 1993). They were initially used to develop an assessment strategy (Ash 1995) and entrance exam to credential overseas-trained dietitians to work in Australia (DAA 2015e), however, they have been applied much more broadly. The application of the competencies in dietetics has included:

1. University academics in dietetics use the competencies to inform the development of the curricula including assessment strategies and competency assessment tools for use during clinical placements (DAA 2011).

2. The Australian Dietetics Council uses the competency standards as the basis for university accreditation processes (DAA 2011).

3. DAA encourages dietitians to use the competency standards to determine their need for professional development (DAA 2015d) such as for dietitians changing employment into new domains of practice. The APD program builds on the competency standards (Ash et al 2011).
(4) The concept of competence is incorporated into the DAA Code of Ethics (DAA 2013a) and the DAA Code of Professional Conduct (DAA 2013b) where all dietitians are required to provide safe, competent practice and recognise their limitations.

(5) The competency standards describe the role of the dietitian and provide a means to communicate with other professions, occupations and stakeholders (DAA 2015d). The Allied Health Professional Association (AHPA 2015) for example, requires occupations to have clearly articulated national entry-level competency standards and assessment procedures in order to be eligible to meet their definition of allied health profession and qualify for association membership.

(6) The National Competency Standards for Entry-level Dietitians have been used as a basis for the development of the higher credentials of Advanced Practitioner and Fellow Competencies (DAA 2015d). The approach used by the Australian Dietetics profession has provided a model for dietetics in other countries such as Dietitians Canada who acknowledge the influence of the DAA professional recognition process in developing their own framework for advanced practice in dietetics (Wildish & Evers 2010).

The original competency standards were reviewed in 1989, funded by the DAA (Phillips et al. 2000a). Stage 1 involved a survey with 30 stakeholders (76% response rate) from within the profession (Phillips et al. 2000a). Stage 2 involved purposeful sampling of 24 new graduates who were interviewed using ethnographic methods (Phillips et al. 2000b). The findings supported the core activities of the nutrition care process that had been included in the original competency standards. New areas of practice had emerged, however, such as private practice and management (Phillips et al. 2000a, Phillips et al. 2000b). With 22 per cent of dietitians working in private practice (Phillips et al. 2000c), the original competency
standards were then modified to include the additional skills and knowledge required in these areas (Phillips et al. 2000a). The stage 1 survey had also identified some concerns with the application of the competency standards within the profession. Questions raised by practitioners demonstrated a lack of familiarity, difficulty interpreting the terminology and a reductionist application of the competency standards (Phillips et al. 2000a). A similar result was found in Britain (Lennie & Juwah 2010) in their exploration of assessment practices. Less experienced supervisors reported an inability to translate the competency standards into practical assessments of students on clinical placement.

Federal funding was provided to DAA in 2007 to review the competency standards with consideration given to Mental Health Tertiary Curriculum programs (Dowding et al. 2011). This review was overseen by the Dietetics Standards and Accreditation Committee (the precursor of the Australian Dietetics Council) and the ‘Mental Health in Tertiary Curricula for Dietitians’ Project Steering Group. Critical incident interviews were conducted with 19 new graduates (6-18 months post graduation) exploring core activities; specific areas including chronic disease self-management, counselling and private practice; and a critical incident related to a mental health issue. Analysis included thematic and modified functional analysis. The strong themes that emerged included the need for communication (including chronic disease self-management and motivational interviewing skills), management, advocacy and leadership. “Newer” work settings emerged again including private practice and isolated rural practice with a greater emphasis on interdisciplinary care. Consultation was conducted over 12 months with members of the DAA, competency experts and university academics. Version 3 of the competency standards was released in 2009 (DAA 2009).
These 2009 National Competency Standards for Entry-Level Dietitians contain nine units (or key areas) of competency. Units 4, 5 and 6 relate to the critical areas (or domains) of practice (Individual Case Management, Public Health Nutrition and Food Service Management); Units 2 and 3 are dietetics specific skills (Nutrition Communication and Collection, Analysis and Assessment of Nutrition/Health Data); Units 1, 7, 8, and 9 are the foundational (or generic) competencies (Underlying Knowledge, Research and Evaluation, Management and Organisation, and Professionalism, Advocacy, Innovation and Leadership). Table 2.3 illustrates the interrelationship of the units.

These nine units of competency are then further subdivided into elements of competency that describe what an individual does to fulfil these work roles. The elements are further broken down into 166 performance criteria. Performance criteria specify the observable behaviour required to constitute competent performance to a standard required in the workplace (Ash & Phillips 2000, see Figure 2.5). Unit 4 pertains specifically to the domain of ICM and is concerned with the client centred delivery of medical nutrition therapy to individuals (see Table 2.4).

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

Source: DAA (2009)
### Table 2:2 Structure of the DAA National Competency Standards for Entry-Level Dietitians (2009)

**National Competency Standards for Entry Level Dietitians in Australia**

| Foundation Units of Competency | Unit 1
Demonstrates knowledge sufficient to ensure safe practice |
|-------------------------------|----------------------------------------------------------|
|                               | **Unit 7**
Research & Evaluation
Integrates research and evaluation principles into practice |
|                               | **Unit 8**
Management and Organisation
Applies management principles in the provision of nutrition services, programs and products |
|                               | **Unit 9**
Professionalism, advocacy, innovation and leadership
Demonstrates a professional, ethical and entrepreneurial approach, advocating for excellence in nutrition and dietetics |

| Core Units of Competency | Unit 2
Nutrition Communication
Demonstrates effective and appropriate skills in listening and communicating information, advice, education and professional opinion to individuals, groups and communities |
|--------------------------|----------------------------------------------------------|
|                           | **Unit 3**
Collection, analysis and assessment of nutrition/health data
Collects, organises and assesses data relating to the health and nutritional status of individuals, groups and populations |

| Critical Practice | Unit 4
Individual Case Management
Manages client-centred nutrition care for individuals |
|------------------|----------------------------------------------------------|
|                  | **Unit 5**
Community and Public Health Nutrition and Advocacy for Food Supply
Plans, implements and evaluates nutrition programs with communities or populations as part of a team |
|                  | **Unit 6**
Food Service Management
Manages components of a food service to provide safe and nutritious food |

Source: DAA (2009)
### Tables 2:3 Dietitians Association of Australia Unit 4 ICM Elements of Competence and their Related Performance Criteria (2009).

<table>
<thead>
<tr>
<th>Elements</th>
<th>Performance criteria</th>
</tr>
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</table>
| 4.1 Undertakes screening and assessment to identify and prioritise those at nutritional risk | 4.1.1 Demonstrates awareness of the range of validated nutrition screening and assessment tools available, including strengths and limitations  
4.1.2 Identifies and uses appropriate validated tools in nutrition screening and assessment  
4.1.3 Includes appropriate follow-up timeline |
| 4.2 Determines nutritional status using assessment data | 4.2.1 Interprets available documentation to identify problems  
4.2.2 Assesses anthropometric and other body composition data  
4.2.3 Assesses clinical, biochemical and other biomedical parameters  
4.2.4 Assesses dietary intake, food habits, mental health and well-being issues, physical activity and lifestyle habits |
| 4.3 Makes appropriate nutrition diagnoses | 4.3.1 Organises, interprets and prioritises data to undertake nutritional diagnoses  
4.3.2 Refers to all available evidence to inform clinical judgement  
4.3.3 Formulates and prioritises nutrition diagnoses |
| 4.4 Prepares plan for achieving management goals in collaboration with client or carer and other members of healthcare team | 4.4.1 Determines realistic goals for nutritional management in collaboration with client and other members of healthcare team  
4.4.2 Identifies nutrition outcome measures and performance indicators  
4.4.3 Develops dietary prescriptions and formulates meal plans and feeding regimens consistent with nutrition goals  
4.4.4 Communicates food service and supply needs of individual clients to appropriate persons  
4.4.5 Considers discharge planning and/or referral to other services |
| 4.5 Uses client-centred counselling skills to facilitate nutrition and lifestyle change and supports clients to self manage | 4.5.1 Considers an environment conducive to effective counselling  
4.5.2 Assists client to clarify issues, identify the barriers to resolution of the problem, and identify appropriate goals and strategies  
4.5.3 Negotiates client oriented goals and strategies  
4.5.4 Provides information and/or referral if necessary, and responds to client concerns  
4.5.5 Evaluates process and outcomes of counselling with client and/or others including family members and carers |
| 4.6 Implements nutrition care plan in collaboration with client or carer and other members of healthcare team | 4.6.1 Selects the most suitable strategy in terms of feasibility and client outcome  
4.6.2 Implements nutrition plan and a system for monitoring and review with client and other healthcare team members  
4.6.3 Promotes physical activity guidelines in care plan with client and other healthcare team members  
4.6.4 Participates in multi-disciplinary team activities (such as case conferencing) to achieve nutrition goals |
| 4.7 Monitors progress of the individual's condition and care and adapts plan as necessary | 4.7.1 Implements the evaluation strategies identified in the nutritional care plan  
4.7.2 Gathers data throughout the care process so that an individual's progress can be monitored against performance indicators  
4.7.3 Determines a timeline for follow-up of clients as necessary |
| 4.8 Documents and communicates all steps of the process | 4.8.1 Maintains clear and concise records, in accordance with the organisation's policy and legal requirements, of all facets of the nutrition care process  
4.8.2 Formulates unambiguous instructions for other personnel involved in the delivery of nutrition care  
4.8.4 Communicates the nutrition care plan to other members of the healthcare team as appropriate, including referring practitioners  
4.8.4 Maintains statistics and other reports required of the organisation |

Source: DAA (2009)
Rather than being a selection of discrete components, the competency standards are intended to be used as an integration of attributes that work together to form active processes of professional practice (McAllister et al. 2010). Ash and Phillips (2000) explain the way the integration is applied:

In the development of the care plan for the individual, interpretation or translation of scientific knowledge and principles into practical information (Unit 2), collection, analysis and assessment data (Unit 3) and assessment of the influence and contribution of activities promoting a safe and nutritious food supply would occur. In addition, basic skills in research (Unit 7) and demonstration of an organised, professional and ethical approach to work (Unit 8) are also required (p.149).

A Range of Variables Statements and Evidence Guides (DAA 2010) were written to support the Competency Standards. These documents provide details on the types of settings where competent performance is expected, where assessment of competency can take place, which competency elements should be assessed concurrently and what constitutes sufficient evidence of competency. The document aimed to consider new areas of growth within the dietetics profession (DAA 2010).

These supporting documents were not disseminated with the original 1994 competency standards but were included in the DAA report to NOOSR. With the third published version of competency standards the original Range of Variables and Evidence Guides documents were reviewed in consultation with academics from accredited tertiary dietetics programs and disseminated to DAA members via their website (DAA 2010). Since this doctoral research
has been conducted, a further revision of the DAA competency standards occurred, version 4 of the standards released in April 2015 (DAA 2015f; see Appendix 2).

2.6 The Challenges of Workplace Assessment

The difficulties with assessing student performance in the workplace are well reported in education literature (Epstein & Hundert 2002; Levett-Jones et al. 2011). Competency-based assessment is a human construct and is inherently subjective. Human decision, with its moral and social component, is involved in the definition of competence, the development of standards and the assessment of performance (Grealish 2009). Learning occurs within a socio-cultural context and assessment is influenced by the student’s socialisation and the relationship between the student and supervisor (Duke 1996; Toohey et al. 1996). Personal factors (such as student anxiety) or external factors (such as case complexity) can influence student performance (Levett-Jones et al. 2011). Real-life environments, such as those used in health, are dynamic and unpredictable (Levett-Jones et al. 2011) and it is therefore impossible to ensure that all students will be provided with the same learning and assessment experiences (McAllister et al. 2010). The challenge for workplace assessment is to consider how assessors can be best supported to make quality judgments.

Workplace assessments have traditionally been viewed from a positivist paradigm where there is ‘one truth’ in regard to the measurement of competence. Within this framework competent ‘actual’ performance can be objectively measured using valid and reliable assessment techniques (Govaerts & van der Vleuten 2013; O’Brien 2013). Reliability is a measure of the consistency of an assessment (Wass et al. 2001). Validity pertains to the extent to which an assessment task measure what it purports to measure (Wass et al. 2001).
Using Miller’s Model of Clinical Assessment (shown in Section 2.2 as Figure 2.3 p.24), Wass and colleagues (2001) suggest that clinical education has traditionally focused on the knowledge (knows) and skills (knows how) aspects of clinical competence because they can be more reliably assessed but these are not recognised as valid assessments of actual performance (Wass et al. 2001).

Simulated environments (refer back to Figure 2.2, p.24) such as OSCEs can improve the reliability of performance assessments through standardisation but Wass and colleagues (2001) argue that this is at the expense of validity. Assessments conducted in simulated environments do not dependably predict a health professional’s actual workplace performance (Kopelow et al. 1992; Rethans et al. 1991). Simulated assessments can contribute to performance assessments (DAA 2011; Khan & Ramachandran 2011), but workplaces are considered to be the ‘gold standard’ environments for determining competence to practice (Eraut 1994; Norcini 2010; McAllister 2005). The workplace, rather than providing fragmented tasks, provides the complex challenges that are more likely to reflect actual performance (Boud 2000).

In Australia, speech pathology (McAllister et al. 2006), physiotherapy (Dalton et al. 2008) and occupational therapy (Rodgers et al. 2014) have nationally validated competency-based assessment tools for use during clinical placement. Palermo and colleagues (2014b) have argued that a standardised national assessment tool for dietetics is unlikely to be able to meet the needs of the dietetics profession given the different contexts of the three domains of nutrition and dietetics (individual case management, community and public health nutrition, and food service management). There is limited published research on the methods used to
assess clinical competence in the dietetics profession. Recent research suggests that current techniques are based on historical practices rather than evidence (Palermo et al. 2014b). In Canada (Alliance of Canadian Dietetics Regulatory Bodies 2006) and the United States (Academy of Nutrition and Dietetics 2013) national exams are used to assess entry-level competence. In Australia, DAA (2015e) currently uses a written multiple-choice exam and a simulated counselling exam as part of the credentialing procedure for overseas trained dietitians. OSCEs have been used for assessments prior to placements (Hawker & Walker 2010) and a portfolio assessment approach has also been trialed (Bauer & Capra 2013).

Within the dietetics profession varying expectations of competence are evident (Gibson et al. 2015) with more clarity required to define competent performance (Palermo 2014b). Inconsistencies with assessing student performances have been identified by both students (Palermo et al. 2015b) and supervising dietitians (Palermo et al. 2014a). A recent report about the profession illustrates these concerns:

> Current assessment in all practice-based settings was reported to be subjective and inconsistent, largely because of variations in standards across sites and between educators or supervisors. The graduates expressed the view that students, supervisors and educators, and the universities all need to be clear about what an entry-level practitioner ‘looks like’ in order to create appropriate learning opportunities and for fair and transparent assessment of competence (Palermo et al. 2014b, p.20).

Although a holistic approach has been used to develop the DAA competency standards, this approach has not been reported as being applied in practice,
They [practice educators] defined assessment as ticking performance criteria and making a final determination regarding whether a student passes or fails. They saw this to be separate from providing supervision and feedback to the student (Palermo et al. 2014a, p.518).

2.7 Training assessors in competency-based assessment

It is not sufficient to simply provide assessors with instruments. Van der Vleuten and colleagues (2012) recommended that more meaningful assessments can be achieved by providing both resources and professional development for assessors. An increased knowledge of assessment correlates with improved assessment practices (Lennie and Juwah 2010). A rich understanding of competence, a global approach to assessment and consideration of sufficient evidence of competence can support improved assessment practices (McAllister et al. 2010).

A rich understanding of competence and performance supports quality judgment (McAllister et al. 2010). Competency-based assessment is prescribed against standards of performance (Gonczi et al. 1993), where the performance criteria describe the observable characteristics of a competent practitioner. These are intended to ‘aid assessors to determine whether the required level of performance has been reached’ (DAA 2011, p.6). Site-specific exemplars of practice, and textural or visual ‘cues’ or nuances of competent performance unique to each individual workplace setting can inform supervisor’s judgments (Crossley & Jolly 2012; McAllister et al. 2010). Supervisors’ reflection on their own performance and the requirements of their workplace is also recommended (Ash & Phillips 2000). There is some evidence that a shared interpretation of performance can be achieved through ‘socio-cultural’
interventions such as discussion between assessors using examples of student performance (Govaerts & van der Vleuten 2013; Holmboe et al. 2004).

Credible judgments are supported by a holistic approach to assessment (Cohen et al. 1991; Crossley & Jolly 2012; Govaerts et al. 2002). Rather than just measuring observable behaviour, a holistic approach allows the assessor to include the generic competencies or attributes that enable us to co-ordinate and integrate the core occupational competencies (Schuwirth & Ash 2013; McAllister et al. 2010). A global approach captures those intangible competencies that cannot be observed directly but can only be inferred from performance (Chapman 1998). Global ratings also consider the student’s ability to transform competence from one setting to another (Cox 2000; Sheepway et al. 2014). With this paradigm, learning is not a product that must be acquired but rather a process or journey (McAllister et al. 2010).

Valid judgments are supported by multiple sources of evidence (Schuwirth & van der Vleuten 2003). Dalton and colleagues (2009) recommend that supervisors inform their assessments with evidence from recorded observation, questioning, feedback from other clinicians, simulation activities, case notes and other written records, work projects such as case presentations and self assessments. Credible evidence is achieved through thorough formative assessment, ongoing feedback and consideration of performance over the duration of the placement (Peter et al. 2001). This evidence can take the form of both qualitative and quantitative data (Schuwirth & van der Vleuten 2011). Qualitative feedback provides the rich contextualised detail required by students to identify specific strategies to improve their practice (Govaerts & van der Vleuten 2013; Kogan et al. 2011; Palermo et al. 2015b).
Students need the opportunity to demonstrate competence with a variety of cases and in a variety of settings (Ash & Phillips 2000).

A challenge with providing clinical supervisors with sufficient training in assessment is the geographical distribution of placement sites, prohibiting face-to-face education for all supervisors. Web-based delivery may offer a potential solution as it transcends geographical and time constraints (Huckstadt & Hayes 2005) and has been shown to be able to achieve equivalent outcomes (satisfaction, knowledge retention and change in practice) when compared to face-to-face delivery (Cook & Steinert 2013; Maloney et al. 2013).

A constructivist approach to learning is recommended for web-based delivery (Bangert 2008; Ng’ambi & Lombe 2012). Kyeong-Ju Seo and Engelhard (2014) found clinical supervisors demonstrated improvements in the quality of their clinical education skills and practice after completing a constructivist online program. The inclusion of an online discussion forum is consistent with constructivist pedagogy and also supports increased social connectivity and engagement during online learning (Cook & Steinert 2013). The use of videos in web-based education can also help to engage users (Azer et al. 2013; Chen et al. 2013 Kyeong-Ju Seo & Engelhard 1014; Maloney et al. 2013). A learner-centered approach to Web-based education (Ng’ambi & Lombe 2012; Parks 2011) is also recommended as it allows participants to be independent self-paced learners and to select content in a way that met their learning style.

2.8 Research Questions

This research aims to:

(1) Evaluate the experiences and service satisfaction of stakeholders involved with health
services outside the hospital setting that provide ICM placements settings for student
dietitians specifically:

i. To determine if clients are satisfied with the quality of service provided by student
dietitians completing their ICM placements at a student-assisted outpatient dietetics
clinic.

ii. To explore the experiences of residents and clients with the services provided by
student dietitians completing their ICM placements at residential aged care facilities.

iii. To identify whether students are satisfied with the quality of their ICM placement
experiences outside the hospital settings when compared to a traditional hospital
placement.

(2) Identify the extent to which Australian tertiary dietetics programs are using placements
outside the hospital settings for ICM placements, specifically:

i. To identify how Australian Universities utilise non–hospital practice settings for their
dietetic students’ ICM placements.

ii. To identify the practices used by Australian Universities to assess the performance of
dietetic students as observed by clinical supervisors during their individual case
management (ICM) placements.

(3) Explore the development of ICM competencies in placements outside the hospital setting,
specifically:

i. To identify the elements of competency and related performance criteria, as described
by the Dietitians Association of Australia (DAA 2009) for ICM that can be achieved
on placements outside the hospital setting.

ii. To achieve consensus in clinical supervisors assessment of student performances in ICM competencies from cases obtained in primary health and aged care settings.

iii. To make and use audio-visual recordings of authentic student-client encounters in aged care and primary health to define entry-level performance.

(4) Apply the research from Phases 1 to 3 to develop a web-based program to support supervisors in assessment of student dietitian performances in a range of ICM settings, specifically:

i. To explore the overall experiences of stakeholders with this program.

ii. To identify improvements that could be made to the program to improve its context, pedagogy, usability and accessibility.

iii. To evaluate whether the program is able to support supervisors in assessments of student dietitian performances in a range of ICM contexts.
Chapter 3: Methodological Background

Since this thesis is presented by published works each chapter contains a detailed description of the methods used for each individual study within the journal article. This chapter provides background on the philosophical framework for the research and justification for the methods and data analysis selected for each study. Ethical considerations are addressed together at the end of the chapter.

3.1 The Philosophical Framework

This research is based on a pragmatist philosophy where knowledge and ideas are acquired for the purpose of solving practice-based problems as they arise in life (Cherryholmes 1992). The thesis has evolved as a consequence of the practice demands of the university context to provide a sufficient number of ICM placements for dietetic students that meet the requirements of the Australian Dietetics Council (ACD) (the accrediting body of the DAA) and adequately equip graduates to meet the current demands of the health sector.

The health care system has its origins in a biomedical model and the positivist tradition, relying on quantitative methods where reality is a single objective truth. In this model the researcher must be separate from the research study and truth is discovered through use of the scientific method (Shaw et al. 2011). The researcher views social research objectively as time and context free, and numerically measurable, aiming to test stated hypotheses and eliminate bias using valid, reliable and generalisable research methods (Johnson & Onwuegbuzie 2004). Shaw and colleagues (2010) argued that a positivist approach alone does not capture the context, complexity and patient centeredness required in health practice. Likewise in educational research it is extremely difficult to simplify and control the variables of the
sociocultural context (Scotland 2012). In particular, the processes of assessment are inherently subjective, complex and socially constructed (Grealish 2009).

Qualitative methods allow a greater depth of exploration of the experiences and interpretations of research participants than quantitative methods (Pearson & Hannes 2013). An interpretivist phenomenological approach to qualitative research makes the assumption that reality is socially constructed through language and shared meanings (Pearson & Hannes 2013). It explores everyday experiences in real-world settings with the aim of gaining a deeper understanding of the significance of the experience (Yin 2011). Interpretivist phenomenological research requires the researcher to make explicit their understandings, biases and beliefs and through this awareness to be able to minimize the bias imposed by their position (Yin 2011). This approach is subjective and interpretive. Rather than being concerned with reliability, validity and generalisability, it is interested in the credibility, defensibility and transferability of the insights that are uncovered (Pearson & Hannes 2013).

In practise, however, dietitians use both quantitative and qualitative sources to inform their practise. Using the pragmatist ‘world view’ it is the research questions, rather than a preferred philosophical commitment, that are the key determinants of the methods selected (Glogowska 2011; Johnson & Onwuegbuzie 2013). Such an approach values multiple perspectives and therefore adopts what is termed a mixed-methods approach, defined by Creswell & Plano Clark (2007) as ‘collecting, analysing, and mixing both quantitative and qualitative data in a single study or series of studies’ (p. 5). Mixed methods (also known as multi method, multiple method, multi-strategy, mixed methodology research) approaches have been used in health, educational and dietetics research (For example: Ash et al. 2011;
Glogowska 2011; Grealish et al. 2013) and align with the interdisciplinary, complex and dynamic context of the current healthcare system (Johnson & Onwuegbuzie 2013). A mixed-method approach was selected for this doctoral research with the aim of achieving a more comprehensive and in-depth understanding of the thesis topic than would be achieved by a quantitative or qualitative approach alone. By exploring the phenomenon of interest with both qualitative and quantitative data the weakness of each method can be offset by the strengths of the others (Glogowska 2011).

Wiggins (2012) has identified the lack of a quality framework by which to analyse and evaluate mixed method research. The philosophical difference, and at time contradictions, from which these methods originate has created challenges for researchers (Glogowska 2011; Shaw et al. 2011). Wiggins (2011) suggests the solution lies in celebrating the relationship of diversity between qualitative and quantitative methods, holding the juxtaposition together and preserving their difference at the level of their worldviews. Greenwood and Terry (2012) stress the importance of a rigorous research design when mixed methods are adopted, including documentation at the planning stage of where, how and why integration will occur.

In this doctoral research, both quantitative and qualitative methods are used to explore the experiences and perceptions of key stakeholders involved in ICM placements outside the hospital setting including consumers, students, clinical supervisors and placement co-ordinators. Phase 1 presents an evaluative case study of an innovative clinical education model that provides dietetic services in outpatient and aged care settings. Phase 2 uses a national study to survey the practices used by Australian tertiary dietetic programs during ICM placements. These findings are then used to inform the methods used in Phase 3, where
a panel of experienced clinical supervisors assess the performances of student dietitians as observed from video recordings of authentic student-client consultations. A three-round modified Delphi study is used to see: (1) if and how ICM competence develops in settings outside the hospital; (2) if a panel of experienced clinical supervisors can achieve consensus in their assessments; and (3) whether the video recordings of the student performances can be used to define entry-level competence in these non-traditional ICM settings. The research instrument used for this study includes a VAS scale and Behavioural Descriptors (McAllister 2006), and a global qualitative description of performance. A focus group discussion with Phase 3 participants was added to enable a deeper exploration of the assessment process. Finally, Phase 4 uses a less traditional methodology: a design-based research process, to develop an innovative solution to support supervisors in their assessments of student performances during ICM placements. Table 3.1 provides an overview of the questions, data sources, methods, research instruments, analysis and reporting used for this research. Table 3.2 presents the peer review articles where each phase of the research has been published and how this relates to the chapters in this document.
### 3.2 An Overview of the Methods

#### Table 3:1 Overview of the Methods Used to Answer the Research Aims.

<table>
<thead>
<tr>
<th>Research questions</th>
<th>Data source</th>
<th>Research method</th>
<th>Data Instrument</th>
<th>Analysis</th>
<th>Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1 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.</td>
<td></td>
<td>Case-study incorporating Studies 1-3</td>
<td></td>
<td></td>
<td>Data reported independently and then considered together, in Manuscript 1, with the intention of providing a more comprehensive evaluation of the service.</td>
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<tr>
<td>Study 1</td>
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<tr>
<td>i. Are clients satisfied with the quality of service provided by student dietitians completing their ICM placements at a student-assisted outpatient dietetics clinic?</td>
<td>Clients attending a student-led outpatient dietetics clinic.</td>
<td>Pre and post written surveys</td>
<td>Modified SERQUAL scale</td>
<td>Quantitative Cronbach’s SERQUAL GAP</td>
<td></td>
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<tr>
<td>Study 2</td>
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<tr>
<td>ii. Are residents and staff satisfied with the services provided by student dietitians completing their ICM placements at residential aged care facilities?</td>
<td>Staff and residents from two aged care facilities receiving outreach services from a student-led dietetics clinic.</td>
<td>Focus groups and personal interviews</td>
<td>Semi structured questions</td>
<td>Qualitative Thematic analysis: (van Manen 1984)</td>
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<td>Study 3</td>
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<tr>
<td>iii. Are students satisfied with the quality of their ICM placement experiences outside the hospital setting when compared to a traditional hospital placement?</td>
<td>Masters of Nutrition and Dietetics Students at the University of Canberra completing ICM placements</td>
<td>Web-based surveys</td>
<td>Student satisfaction survey</td>
<td>Qualitative Wilcoxon Signed Rank (p&lt;0.05) Cohen’s criteria</td>
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<tr>
<td>Phase 2 Aim (2) To identify the extent to which Australian tertiary dietetics programs are using settings outside the hospital for ICM placements.</td>
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<td>Study 4</td>
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<tr>
<td>iv. How do Australian Universities utilise non–hospital practice settings for their dietetic students' ICM placements?</td>
<td>University placement coordinators of ICM placements from DAA accredited dietetics program</td>
<td>Web-based survey</td>
<td>Dietetics Placement Mapping Questionnaire (DPMQ)</td>
<td>Quantitative Descriptive statistics Qualitative Content analysis</td>
<td>Results informed methods used in Phase 3. Findings reported, in Manuscript 2, together with findings from Study 5’s focus group discussion.</td>
</tr>
<tr>
<td>v. What practices do Australian Universities use to assess the performance of dietetic students as observed by clinical supervisors during their ICM placements?</td>
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</table>
### Phase 3 Aim (3) To explore the development of ICM competencies in placements outside the hospital setting.

#### Study 5

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Research Method</th>
<th>Data Instrument</th>
<th>Analysis</th>
<th>Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert Clinical Supervisors</td>
<td>Web-based Delphi - surveys</td>
<td>Competency assessment research MSD1, MSD2, MSD1 3 Delphi surveys* Structured protocol</td>
<td>Qualitative Median scores Consensus range ≤ 3 Qualitative Thematic analysis (van Manen 1984)</td>
<td>Results from each round shared with participants and used to inform the subsequent round. Results reported collectively in Manuscript 3, with results for objective vi published together with findings from Study 4, in Manuscript 2.</td>
</tr>
</tbody>
</table>

**vi.** Which elements of competency and related performance criteria, as described by the Dietitians Association of Australia (DAA, 2009) for ICM, can be achieved on placements outside the hospital setting?

**vii.** Can experienced clinical supervisors achieved consensus in their assessments of ICM competencies from student performances in primary health and aged care settings?

**viii.** Can audio-visual recordings of authentic student-client encounters in aged care and primary health be made and used to define entry-level performance?

### Phase 4 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.

#### Study 6

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Research Method</th>
<th>Data Instrument</th>
<th>Analysis</th>
<th>Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAA Board of Directors Participants at DAA conference 2013</td>
<td>Formative feedback</td>
<td>Informal feedback on iterations</td>
<td>Qualitative Feedback and program refinement tabulated.</td>
<td>Results used to inform iteration 2.</td>
</tr>
<tr>
<td>Clinical supervisors</td>
<td>Data generated from web-based program</td>
<td>Pre and post tests</td>
<td>Quantitative Descriptive stats. Mean, range Qualitative Content analysis Qualitative Thematic analysis (van Manen 1984)</td>
<td>Results reported separately but considered together: (1) to inform iteration 3; and (2) in Manuscript 4.</td>
</tr>
<tr>
<td>Focus group and personal interviews</td>
<td>Focus group and personal interviews</td>
<td>Semi-structured questions</td>
<td>Qualitative Thematic analysis (van Manen 1984)</td>
<td></td>
</tr>
</tbody>
</table>

**ix.** What are the experiences of stakeholders with the program?

**x.** What improvements can be made to the program to improve its content, pedagogy, usability and accessibility?

**xi.** Does the program support supervisors in their assessments of student dietitians’ performances in a range of ICM contexts?

A reference group was established with health sector, academic, regulatory, student and consumer representation. This group met three times over the duration of this research and provided advice on the direction of Study 4, 5 & 6.
3.3 Research Methodology

In this section the theoretical background on the research methods used is presented and discussed with reference to how they will be used to answer the specific research questions shown in Table 3.1: case study research, survey research, Delphi study, design based research focus groups and personal interviews. Data analysis decisions will be presented together with the relevant research methods. Ethical considerations for all studies are considered together at the end of the chapter.

3.3.1 Case study research

Case studies have most commonly been used in the social sciences but have also been used in education (Johnsson and Hager 2008) and healthcare contexts (Crowe et al. 2011; Moskowitz et al. 2006; Palombaro et al. 2011). They are conducted to gain an in-depth and holistic understanding of a single phenomenon (Harris et al. 2009; Green & Thorogood 2009; Camille 2014). ‘Case’ can refer to a setting, geographical site (Harris et al. 2009), an issue or event of interest (Crowe et al. 2011), and can be conducted with individuals or communities (Harris et al. 2009). Case studies can be collective or singular, with the latter considered appropriate when the phenomenon is unique in someway (Crowe et al. 2011).

Case study research has been criticised for producing too much documentation and for lacking design rigor (Yin 2009). These limitations can be minimised by: (1) describing the steps involved in case selection, data collection and justification for the methods.
chosen; (2) focusing data collection, in line with the research questions; and (3) approaching the same question from different perspectives (triangulation) supporting a more comprehensive picture of the ‘case’ (Crowe et al. 2011).

A case study design was selected for Phase 1 as it supported a multi-faceted examination of an ICM clinical placement outside the hospital setting. Given that ICM placements in dietetics have traditionally been conducted in hospitals, this setting was unique and a single-case study design was deemed appropriate. Case studies have been classified as exploratory, descriptive, explanatory (Yin 2009), interpretive or evaluative (McDonough & McDonough 1997). Phase 1 is an evaluative case study as it makes a judgement (McDonough & McDonough 1997) about the satisfaction of key stakeholders (students, outpatient clients, staff and residents) involved with service delivery. Research by Allan and colleagues (2010) suggests that patient supply is the most critical factor influencing the success of university-based health services and client satisfaction is a key consideration influencing referrals and usage (Andaleeb 2001). The perspectives of consumers and students were therefore important in evaluating the service.

Although case studies are traditionally classified as qualitative research (Harris et al 2009), the method allows the use of both qualitative and quantitative methods, with mixed methods often adopted (Pearson et al 2010; Sheikh et al 2009). Phase 1 included three small studies that collected data from the perspective of clients attending the outpatient setting (Study 1 - quantitative), staff and residents from two aged care
facilities that received outreach services (Study 2 – qualitative) and students completing ICM placements at the service (Study 3 – quantitative). The methods of each of these studies and the rationale for their adoption will be described in more detail later in this chapter. Although the data were collected and reported independently, they were considered together as a case study with the intention of providing a more comprehensive evaluation of the service. The limitation with case study research is the small sample size and resultant inability to generalise results (Yin 2009). However this case study was conducted within the context of other studies making a useful contribution by allowing an in-depth, micro-level examination of a clinical placement setting outside the hospital.

3.3.2 Survey Research

Survey research was selected for Phase 2 (Study 4) and incorporated as part of a case study in Phase 1 (Studies 1 and 3). [Study 5 also used web-based surveys. The detail specific to this study will be discussed in the context of the Delphi study]. Questionnaires collect written self-reported data to describe a phenomenon (Chasteauneuf 2010). They have been used extensively in health research and provide an appropriate means to measure participant knowledge, behaviour (Boynton & Greenhalgh 2004) and perceptions (Rattray & Jones 2005). Survey research was deemed suitable for Studies 1, 3 and 4, rather than a more exploratory method, as sufficient information was already known about these content areas to support appropriate questionnaire design (Boynton & Greenhalgh 2004; Leung 2001).
Boynton and Greenhalgh (2004) recommend that when a previously validated questionnaire is available addressing the research question and context, its use is preferable to developing a new instrument. It is more efficient, allows comparison with other studies and assists with publication of the study (Boynton & Greenhalgh 2004). SERVQUAL is a generic instrument used to measure service quality (Parasuraman et al. 1988). It has been previously validated (Parasuraman et al. 1988), has been used extensively in health and patient satisfaction literature (Alrubiee & Lakaaida 2011; Francesca & Harini 2013; Ladhari 2009), and is modifiable to fit the characteristics of different health care settings (Palihawadana & Barnes 2004). SERVQUAL was therefore selected as the questionnaire for use in Study 1 to measure client satisfaction with the Student-Assisted Service.

The original SERVQUAL scale includes 22-paired items across 5 dimensions that are outlined in Table 3:3 (Parasuraman et al. 1988). An extra dimension of “Usability” has been added for use in the healthcare domain and relates to how easy to understand and use the service is for the consumer (Strawderman & Koubek 2006). SERVQUAL measures service quality as the difference between the average expectation score and the average perception score, where a positive result indicates client satisfaction with the service (Parasuraman et al 1988). In Study 1, data was collected from outpatient clients who attended an initial appointment before (measuring expectation) and after each consultation (measuring perception). For each dimension, mean scores were calculated for each participant. SERVQUAL gaps scores, for each dimension and overall, were calculated by deducting the mean perception score from the mean expectation score (Hoffman & Bateson 2010).
Table 3.3 Definitions of the SERVQUAL Dimensions.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>Delivering the promised service, dependably and accurately</td>
</tr>
<tr>
<td>Tangibles</td>
<td>Appearance of the physical facilities, personnel, equipment and communication materials</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>Willingness to provide prompt service and help customers</td>
</tr>
<tr>
<td>Assurance</td>
<td>Ability of employee to inspire trust and confidence in the organization through their knowledge and courtesy</td>
</tr>
<tr>
<td>Empathy</td>
<td>Care and personalized attention given to service receiver</td>
</tr>
</tbody>
</table>

Source: Parasuraman et al. (1988)

Given the novel and specific contexts of Studies 3 and 4 purpose built web-based surveys were developed using the Qualtrics Survey Software (version 12018, 2005, Qualtrics). Web-based surveys are more efficient both in terms of data collection and analysis and are more cost effective, (Baruch & Holtom 2008; Jansen et al. 2012; Reynolds et al. 2009; Wyatt 2000). Web-based research has been criticised due to coverage and sampling error (Evans & Mathur 2005). Dietetics in Australia is a small profession and therefore universal sampling was applied with all members of the population groups (Study 3: final year Masters of Nutrition and Dietetics students completing their clinical rotation, as part of a coordinated program in dietetics; Study 4: placement coordinators for the accredited Australian tertiary dietetics programs) invited to participate in each study. Both these populations are known to be computer literate and therefore no bias was implied by the selection of a web-based survey (Wyatt 2000). In Study 4, the use of a web-based survey enabled participation by placement coordinators who were geographically dispersed (Wyatt 2000).
Web-based surveys tend to get relatively low response rates and concerns have been raised in regard to retention rates (Fernandez et al. 2012). These risks have the potential to influence both the representativeness and the quality of online survey data. In Studies 3 and 4 the following strategies were adopted in an attempt to maximise both response and retention rates: (1) a personal email was sent to each participant that explained the benefits of the research to the participants, emphasising that their opinions would be heard and feedback considered. This was followed by a telephone call to all participants to clarify their understanding of the research project (Bennett & Nair 2010; Foddy 1993); (2) Participants were sent a URL link to a short ‘user-friendly’ survey (taking ten minutes or less to complete) (Jansen et al. 2007; Vicente 2010) and allowing anonymity; and (3) participants were sent a reminder email offering an extension to the initial time frame for survey completion (Fernandez et al. 2011; Wyatt 2000).

Reliable surveys obtain consistent results from repeated samples over time (Rattray & Jones 2007). Standardisation, where all participants are asked exactly the same questions in an identical format, improves reliability (Boynton & Greenhalgh 2004). Standardised surveys, with predominantly closed questions, were used in all three studies. Cronbach’s alpha statistic provides a measure of internal reliability by using item correlations to determine whether all items in each dimension are measuring the same domain (Rattray & Jones 2007). In Study 1, the SERVQUAL scale was modified to consider the specific context of the Student-Assisted Service. The modified version included: perceived reliability (3 items); responsiveness (3 items); tangibles (3 items); empathy (4 items); assurance (7 items); and usability (3 items). Internal reliability was measured within each
A ‘Likert scale’ provides a standardised approach to rank participant attitudes (Rattray & Jones (2007) and was used in Studies 1 and 3. There is some controversy as to whether data from Likert scales should be treated as interval or ordinal. Jamieson (2004) argues that analysis using non-parametric tests is preferable when using data from Likert scales, as although they support rank order, the value between intervals cannot be presumed to be equal. In Study 3, independence of the data could not be assumed, and therefore the Wilcoxon Signed Rank Test was used to determine if there was a statistically significant difference, at the 95% confidence interval, between the student experiences in the Student-Assisted Service and the hospital setting across all items. Effect size, or the strength of the relationship, was then used to interpret these statistics (Pallant 2013). When categories are used, as in the case of SERVQUAL, the assumption of interval data for Likert scales is deemed acceptable (Pallant 2013) and the use of means for the GAP analysis is supported (Hoffman & Bateson 2010).

Closed questions are easier to complete, code, record, analyse and report (Leung 2001) but can restrict the depth of participants’ responses potentially reducing the quality of data collected (Rattray & Jones 2007). Some open questions were therefore incorporated into all surveys to allow further exploration of the issues (Leung 2001). Analysis of the open-ended questions was conducted using a descriptive approach. Descriptive qualitative research aims to provide a straight description of phenomena.
using language as a means to convey the facts as intended by the participants (Sandelowski 2000). Consistent with this approach, in Study 4, responses from open-ended questions were sorted into response category themes and common themes counted (Sandelowski 2000).

Validity refers to whether a questionnaire measures what it intends to measure (Rattray & Jones 2007). The questions for Studies 3 and 4 were informed by a review of relevant literature, consultation with experts and proposed participants, increasing content (face) validity (Rattray & Jones 2007). The research aims were also frequently revisited to ensure these were reflected in the survey items (Rattray & Jones 2007). Attention was applied to ensure questions were relevant and unbiased (Leung 2001), given the finding that participants tend to attempt to answer survey questions even when they are not relevant (Foddy 1993). Web-based surveys have the advantage of offering complex branching, based on previous responses (Roberts 2012). Due to the potential for diversity in placement programs complex branching was applied in Study 4 to ensure that questions were appropriately targeted to the participants.

For results to be meaningfully compared, all respondents need to interpret questions in the same way. To achieve this Foddy (1993) suggests: (1) using concrete and easily understood words; (2) making questions as brief as possible without lessening the clarity of the definitions of key concepts; and (3) avoiding double-barrelled and negative questions as they are more difficult to interpret. In Study 3 a combination of positively and negatively worded questions were also used in order to minimise the
danger of acquiescent response bias (Rattray & Jones 2007). Negative scores were then reversed prior to analysis (Pallant 2013). All surveys were pilot-tested with individuals who had similar characteristics to the participants and recommendations adopted to further improve face validity and to test the survey process (Foddy 1993).

### 3.3.3 The Delphi Method

A three round modified-Delphi study was selected as an appropriate method for Phase 3 (Study 5). This study aimed to explore the development of ICM clinical competencies in placements outside the hospital setting, with the specific objectives to determine: (1) which elements of competency and related performance criteria from Unit 4 (DAA, 2009) can be achieved on placements outside the hospital setting; (2) whether experienced clinical supervisors can achieve consensus in their assessment of ICM competencies from student performances in primary health care and aged care settings; and (3) whether audio-visual recordings of authentic student-client encounters can be used to define entry-level performance in these settings.

The Delphi method has its origins with the Rand Corporation and has since been widely accepted throughout the world in many industry sectors including health and education (Skulmoski et al. 2007). This method requires purposeful sampling of experts who have the capacity and commitment to participate (Powell 2002). The method involves the systematic and controlled refinement of expert opinion, using a series of data collection and analysis techniques interspersed with feedback, in order to achieve a consensus (Bowles 1999).
The Delphi method is well suited to a research question when there is incomplete knowledge or lack of agreement about a problem or phenomenon (Skulmoski et al. 2007; Palermo et al. 2015a). The Delphi approach is useful if it provides more accurate assessments or judgments than those obtained either by individuals or by interacting groups (Powel 2002). The approach allows responses to be anonymous, thereby reducing the pressure on respondents to conform to dominant group attitudes (Bowles 1999).

It is argued that since the Delphi technique moves towards a consensus it reflects a normative rather than an informational influence (Powell 2002). Results of the Delphi should therefore be interpreted as offering an expert opinion rather than indisputable fact (Powell 2002). Evidence-based practice integrates findings from systematic research with clinical expertise and at this level the Delphi approach can make a valuable contribution (Powell 2002). Justification of detailed decision making and rigor in the execution of the study can improve the credibility of the method including choice of expert panel, data collection procedures, identification of justifiable consensus levels and means of dissemination and implementation (Powell 2002). A Delphi study should discuss its limitations, possible implementation of findings and future research directions (Powell 2002).

The success of a Delphi study rests on the combined expertise of the participants who make up the panel (Powel 2002). There is very little evidence on the effect of the number of participants on the reliability or validity of consensus processes (Murphy et
Participants should ideally be experts who reflect current knowledge in the appropriate area, possess credibility with the target audience and be relatively impartial (Jairath & Weinstein 1994).

The four key features of the Delphi method are anonymity, iteration with controlled feedback, statistical group response and expert input (Goodman 1987). However there is no ‘typical’ Delphi and the method can be modified to suit the circumstances of the question (Powell 2002). Both qualitative and quantitative approaches can be used in the Delphi process (Powell 2002). Content analysis techniques are typically employed to identify the major themes during the first round of the Delphi process and these themes are then used for the next stage of the Delphi (Powell 2002). Second or subsequent techniques are analysed using ranking or rating techniques (Powell 2002). Participants are provided with information on the mean, dispersion and where their score lies and have the opportunity to revise their scores in subsequently rounds (Powell 2002).

A number of studies have used a modified-Delphi approach that has provided panellists with an opportunity to discuss their decisions and controversial issues and to share opinions and experiences between rating rounds (Brace-Govan et al. 2001; Dent et al. 2008; Jette et al. 2012; Junger et al. 2009; Kizawa et al. 2011; Wyrwich et al. 2005). This approach allows participants time to consider their ideas and responses before presenting them at a face-to face meeting which promotes careful in-depth thinking while maintaining the benefits of anonymous voting (Brace-Govan et al. 2001).
FEED OUR FUTURE: A pragmatist mixed-methods exploration of Individual Case Management (ICM) placements outside the hospital setting.
COMPASS was validated by McAllister (2005) through a national field trial over two university semesters. Data was statistically analysed using Rasch analysis (Rating Scale Model) using data from 301 assessment events with 219 different students by 107 different clinical educators. Rasch analysis models rater-error and offers procedures to minimise systematic error (Downing 2005). The results showed that the supervisor ratings could be organised into seven categories of performance representing equal and increasing amounts of competence (McAllister 2006) although the behavioural descriptors described only three levels of performance (McAllister 2005). The results also suggested that these behavioural descriptors appropriately described the developmental trajectory from novice to entry-level competence (McAllister 2006).

Like dietetics, speech pathology uses a holistic definition of competence where competence is inferred from performance as part of a continuum of development from novice to entry-level (McAllister et al. 2010). The quantitative research instrument used in Study 5 for the modified Delphi was derived from COMPASS, but used unit 4 of the DAA entry-level competency standards for dietitians (DAA 2009), rather than the speech pathology standards.

3.3.4 Design-Based Research

Within a pragmatist framework there is scope to look beyond the traditional research methods and explore alternative approaches such as design-based research. Design-based research is a methodology that has emerged from education (Anderson & Shattuck 2014) that advances design, research and practice concurrently (Wang &
FEED OUR FUTURE: A pragmatist mixed-methods exploration of Individual Case Management (ICM) placements outside the hospital setting.
It draws from widely used methods such as formative evaluations, surveys, expert reviews, case studies and interviews. By using a combination of methods the credibility and defensibility of the research is strengthened (Wang & Haffafin 2005).

Design-based research is an emerging research paradigm and has, in most instances, contributed only small-scale interventions (Anderson & Shattuck 2012). A recent example where design-based research has been applied in the health care context is a publication by Gray and colleagues (2014). Their paper describes the development of a personalised home-based diabetes education innovation that integrates Web 2.0 and Internet protocol television. Design-based research is considered best-practice for addressing real world education-based problems in complex learning environments, supporting the incorporation of formative feedback, evaluation and empirical analysis (Anderson & Shattuck 2012).

**3.3.5 Focus Groups and Individual Interview**

In Phases 1, 3 and 4 the inclusion of focus groups and individual interviews supported an exploratory, inductive and process orientated approach, where the experiences and perceptions of the participants could be explored (Harris et al. 2009). An interpretivist phenomenological theoretical framework was adopted, where ‘truth’ is contextual and the focus is on the ‘lived experiences’ of individual people, with the aim of representing as closely as possible the participants’ perceptions of each experience (Harris et al. 2009; Pearson & Hannes 2012; van Manen 1984).
Study 2 aimed to explore the experiences of residents and staff with the care provided by the Student-Assisted Services at two residential aged care facilities. A qualitative approach was selected firstly, because the dietetic services implemented at aged care facility were holistic and extended beyond the delivery of individual consultations to residents; and secondly, because the delivery of student-assisted dietetic service into aged care facilities is a new endeavour and is more amenable to an exploratory research approach (Barbour 2005). Study 5 aimed to explore the development of ICM clinical competencies in placements outside the hospital setting. A qualitative approach was selected as it allowed the assessment process to be explored and supported the development of an approach to gain a shared understanding of entry-level competence that was sufficiently dynamic to accommodate a changing healthcare system. In Study 6 the web-based program Feed Our Future was pilot-tested by a group of potential end-users. Through the focus group discussion the clinical supervisors were able to share their experiences with program content and pedagogy including whether and in what way the program had influenced their assessment practices. The discussion explored potential usability and accessibility barriers that were used to informing future improvements to the program.

Harris and colleagues (2009) define a focus group as, ‘A collection of seven to twelve individuals, by purposeful sampling, who are asked questions relevant to general research questions and prompted to respond freely’ (p.81). Focus groups have been previously used in clinical education research to evaluate student-led clinical learning (Grealish et al. 2013) and to explore assessment practices within the Australian dietetic profession (Palermo et al. 2014a, Palermo et al 2015b). They have also been used to
conduct research within aged care services (Kirsebom et al. 2013) and with older persons (Atwal & Caldwell 2005; Laditka et al. 2012), and to understand the attitudes, experiences and satisfaction of consumers with health service delivery (Nyamathi & Shuler 1990). Focus groups have the advantage of making use of group dynamics to stimulate discussion in a secure environment (Nyamathi & Shuler 1990), with homogeneous groups more likely to encourage uninhibited exchange (Barbour 2005). Consistent with this staff and residents were interviewed in, separate focus groups in Study 2.

There is a risk that focus groups can overemphasise consensus (Barbour 2005) and the opinions of more dominant participants may inhibit more passive members (Nyamathi & Shuler 1990). The role of the moderator is crucial in minimising these challenges (Nyamathi & Shuler 1990). Non-structured or semi-structured interview questions allow the participants to tell their story (Harris et al. 2009, Pearson & Hannes 2012, van Manen 1984). There are methodological problems associated with the ageing process that create challenges with obtaining the opinions of older persons (Atwal & Caldwell, 2005) such as visual, auditory, mobility, memory and cognitive impairment, and fatigue. In an aged care context Atwal and Caldwell (2005) advocate the need to provide a focused environment, with semi-structured questions to ensure relevant material is generated and therefore this approach was adopted in Study 2.

Data triangulation strengthens the credibility of the research findings (Harris et al. 2009). In Study 2 the focus group data was triangulated (referred to as ‘within method
triangulation’) with personal interviews to further explore the ideas raised in the focus group and to overcome the methodological challenges associated with the aging process (Atwal & Caldwell 2005). All focus group discussions and personal interviews were audiotaped and annotated. In the focus groups a second research assistant was employed as a scribe. Recordings were transcribed verbatim by the researcher and a research assistant, and crosschecked for accuracy as research rigour is improved when a second researcher independently reviews the transcripts verifying the emerging themes (Yin 2011). The transcripts were analysed independently by the main researcher and research assistant/s with themes highlighted using van Manen’s highlighting approach to thematic analysis (van Manen 1984).

In van Manen’s highlighting approach (1984) the researcher reads the text several times highlighting statements that recur or seem essential to the experience being described. This involves both perceptiveness and sensitivity, reflectively asking, “What makes this experience what it is?” Quotations that capture the ‘essence’ are used to support the emerging theme. The researcher, by bringing a rich understanding of the context, aims to transform these themes, allowing deeper insight around the phenomenon (van Manen 1984). This approach acknowledges the perception, assumptions and potential bias of the researcher. Direct quotes are presented as data, supporting these themes (Harris et al. 2009).
3.4 Ethical Considerations

Ethical approval was provided by the University of Canberra Human Research Ethics Committee for all studies conducted as part of this doctoral research (Project No: 11-98 Phase 1; Project No: 12-209 Phases 2-4, see Appendix 3). This section will discuss in more detail how the contents outlined in National Statement of Ethical Conduct in Human Research (NHMRC, Australian Research Council & Australian Vice-Chancellors’ Committee 2007, updated May 2015), that incorporates the Declaration of Helsinki and considers the Privacy Act 1988, have been considered in the design, conduct and publication of Studies 1 to 6.

Ethical research must have merit and integrity (NHMRC et.al. 2007, updated 2015). The justification for this doctoral research was presented in the introductory chapter. With an ageing population and growth in prevalence of chronic disease, current placement practices may not be best suited to meet the future healthcare and workforce demands. There is a need to better identify current placement practices within the dietetic profession; to explore the experiences of key stakeholders for placements outside the hospital setting; and to consider how student competence develops and can be assessed in these contexts. This research has been positioned within a thorough literature review that considers the definition, development and assessment of competence during clinical placements, with application specifically to the dietetic profession. This research has the potential to benefit health consumers, student dietitians, academics, site supervisors and the dietetic profession; and to add to the body of knowledge on clinical education and workforce development. It will also support the development of the skills and expertise of the primary researcher. Undertaken as a PhD
by published works, this research aims to disseminate and communicate the findings, through peer-reviewed publications, supporting scrutiny of the design and contributing to public knowledge and understanding.

The research methods used in all studies have been informed by a review of relevant literature as presented in this chapter and are described in detail in the subsequent publications. This research was conducted under the supervision of researchers who are experienced in both qualitative and quantitative research methods, and who collectively have knowledge and understanding of the dietetic profession, the healthcare context, aged care and community setting, clinical education and competency-based assessment practices. In addition, an advisory group including consumer, student, industry and academic representation will provide input on the design, data collection and application of the research undertaken in Phases 2 to 4.

The recruitment of participants for this research must be just and respectful (NHMRC et.al. 2007, updated 2015). Participation must be a decision of voluntary choice on behalf of the participant, based on sufficient information and adequate understanding of both the research and the implications of their participation (NHMRC et.al. 2007, updated 2015). In the consumer research, Studies 1 and 2, participants with diminished capacity to provide their own consent were excluded from the research. This includes children under the age of 18. In all other studies, all members of the populations invited to participate were autonomous. For each study various means were used to ensure participants were fully informed about the aim and purpose of each research study, what
their participation would involve, that their participation was voluntary and that they could cease to participate at any stage without penalty, and about issues regarding confidentiality and data security. Methods included: an information session (Study 2); a personal invitation by an independent research assistant (Studies 1 and 2); or a personalised email (Studies 3, 4, 5 and 6). All participants received an information sheet, as well as contact details for complaints, if required. In all studies, participants were provided with an opportunity to clarify their understanding of the research, either in person (Studies 1 and 2) or over the telephone (Studies 3, 4, 5 and 6).

Written consent was required from all participants in all studies, with the exception of Studies 3 and 4. These two studies were anonymous Web-based surveys where completion of the survey implied consent. In Study 5, the panel of experienced supervisors were paid a small honorarium in recognition of their expertise and the time required to complete the research. Financial support was offered to the experienced clinical supervisors, to assist with travel and accommodation costs to attend the focus group in Canberra.

Participation was confidential for all participants, with the exception of those in Study 5. In Study 6, the panel of experienced clinical supervisors was collectively acknowledged on the Web-based program. Also, in Study 5, the clients / residents and the students / dietitians were potentially identifiable as they appeared in the audio-visual material, although their names were not be recorded. These participants signed a
FEED OUR FUTURE: A pragmatist mixed-methods exploration of Individual Case Management (ICM) placements outside the hospital setting.

consent form that explicitly stated that they were given permission for the video recorded material to be used for the development of a Web-based teaching program for use by health professionals. Permission was required to make these recordings available to the panel of experienced supervisors, via a password protected private website, for the duration of the research.

Participants in all studies were free to withdraw from the study, or in the case of Study 5, withdraw their permission for the video recording of their consultation to be used, at any stage without penalty. Data obtained from all studies was kept either in a locked filing cabinet or on a password-protected computer and stored for a five-year period in accordance with the University of Canberra policy. The video recordings were stored securely in the Faculty of Health Clinics in accordance with the Health Records (Privacy and Access) Act 1977 (ACT).

Research is only ethically acceptable if its benefits justify the risks (NHMRC et.al. 2007, updated 2015). The risk to participants for this research was considered minimal. The following matters, however, warrant consideration. Firstly, the Masters of Nutrition and Dietetics students completing their placements in the UC Nutrition and Dietetics Clinic were in a dependent relationship with the researcher who is the placement coordinator for Nutrition and Dietetics. Student results and progress in their placements were not influenced in any way by their participation or non-participation in this research project. This was clearly stated in both the information sheets and the consent forms provided to the students. Secondly, the researcher had an oversight role with the Student-Assisted Services, and the expert clinical supervisors involved in the
student assessments and focus group were dietitians that may be known to the researcher through professional contacts. There was no reason to anticipate that these existing relationships between the researcher and the participants were impaired by the participant's free and voluntary consent and participation in this research. Video recordings were already standard practice within the Student Assisted Services clinic with the client signing written consent for this material to be used for academic purposes. Students regularly viewed these materials for their own and peer learning. The decision of students and clients to allow the use of these materials in the development of a teaching resource for supervisors was completely voluntary. Non-participation had no consequences for either the student or client.

The use of authentic video recordings of student/dietitians client/resident consultations would carry some risk if the material included in the online program were to be used inappropriately. Efforts made to minimise this risk include:

1. The program is available only through a secure platform, and is password protected so that only appropriately qualified users can access the program.

2. The program outline acknowledges participants stating, “Written informed consent was obtained from all participants involved in the research.” “The students involved have generously allowed their learning to be transparent to the profession and have demonstrated their understanding of the importance of life-long learning.”

3. The program begins with an audio introduction that states, ‘Although written informed consent has been obtained for all participants, the demonstration of
professional ethical practice is required when discussing this material’. As a part of their membership requirements with the Dietitians Association of Australia, all dietitians who are entitled to access this program are required to abide by a Code of Conduct (DAA 2013a) and a Statement of Ethical Practice (DAA 2013b). Commitment to these documents is re-affirmed yearly.

(4) Only the recordings where students have successfully graduated from the Masters of Nutrition and Dietetics program are included in the final program. At the end of each assessment the following words have been added, ‘This student has now completed her clinical placement and has met entry-level competence’.

(5) Participants who appear in the program were provided with access to the program and invited, via email, to view the material and provide feedback prior to its release.

Monitoring of this research was ensured through the processes of the University of Canberra Human Research Ethics Committee. The research was conducted in accordance with the approved ethics applications with any variations also approved through the committee. The standard of the research was scrutinised through the peer-review process necessary to achieve publication for the four manuscripts required for this thesis. These deliverables were shared with the research participants. A Health Workforce Australia (HWA) National Clinical Supervision Fellowship provided funding to support Phases 2 to 4 of this research. This will continue to be declared on all relevant publications. HWA approval will be negotiated on a case-by-case basis to
ensure that what is proposed for publication is accurate and appropriately acknowledged.
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.

FORM E: DECLARATION OF CO-AUTHORED PUBLICATION CHAPTER

For use in theses which include publications. This declaration must be completed for each co-authored publication and to be placed at the start of the thesis chapter in which the publication appears.

Declaration for Thesis Chapter 4

Declaration by candidate

In the case of Chapter 4 the nature and extent of my contribution to the work was the following:

<table>
<thead>
<tr>
<th>Nature of contribution</th>
<th>Extent of contribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conception and design, acquisition of data, statistical analysis, interpretation, drafting of the manuscript and critical revision of the manuscript.</td>
<td>75</td>
</tr>
</tbody>
</table>

The following co-authors contributed to the work.

<table>
<thead>
<tr>
<th>Name</th>
<th>Nature of contribution</th>
<th>Extent of contribution (%)</th>
<th>Contributor is also a student at UC Y/N</th>
</tr>
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<tbody>
<tr>
<td>Lauren Williams</td>
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<td>Laurie Grealish</td>
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<td>Maggie Jamieson</td>
<td>Supervision and critical revision of the manuscript</td>
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Candidate's Signature

Date 29/9/2015

Declaration by co-authors

The undersigned hereby certify that:

(1) the above declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of each of the co-authors.
(2) they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
(3) they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
(4) there are no other authors of the publication according to these criteria;
(5) potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit; and
(6) the original data are stored at the following location(s) and will be held for at least five years from the date indicated below:

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4.1 Introduction to the manuscript

This chapter begins with a brief introduction to Phase 1 of the research, linking the contribution made by these studies to the theory and methodology adopted in the thesis. As an innovation, the case study is published under the category of Emerging Science and Translational Applications, and as such, is presented as a short paper due to word limit restrictions. Full details of the study are provided in the appendices (Appendix 4). Chapter 4 concludes by evaluating the contribution Phase 1 makes to the thesis.

The purpose of Phase 1 was to evaluate the experiences and service satisfaction of stakeholders involved with health services, outside the hospital setting, that provide ICM placement settings for student dietitians. Using a case study approach three studies were conducted: (1) to determine if clients were satisfied with the quality of service provided by student dietitians completing their ICM placements at a student-assisted outpatient dietetics clinic; (2) to determine if residents and staff were satisfied with the services provided by student dietitians completing their ICM placements at a residential aged care facility; and (3) to determine if students were satisfied with the quality of their ICM clinical placement experiences in settings outside the hospital when compared to a traditional hospital placement.

One solution to addressing the health workforce agenda is to provide clinical placement experiences for students in underserviced settings. The Student-Assisted Service (SAS) is an innovative model of clinical education where two to three student dietitians provide ICM under the supervision of an experienced clinician. The use of student-
assisted outpatient services by universities to support students in their development of pre-clinical skills is not new. The SAS presented in this chapter is unique in that it combines outpatient clinics with outreach services to aged care facilities. This increases the scope of practice and has enabled the SAS to provide supervised practice hours as part of an accredited dietetics course. Student experiences in the SAS are specifically designed to focus on the development of entry-level competence in ICM practice as specified by the DAA competency standards (DAA 2009).

Phase 1 of this research is consistent with the pragmatist philosophical framework of the thesis. The case study design uses a mixed-method approach to support a more comprehensive evaluation of the clinical placement model. An evaluative case study of consumer and student satisfaction with this model can explore the potential for non-hospital settings to provide supervised practice opportunities for dietitians-in-training while addressing workforce shortages.
Student-Assisted Services (SAS): An Innovative Clinical Education Model that Prepares Graduates for the Future, Contributes to Health Service Delivery, and Addresses Internship Shortages

The combination of an aging population profile and a rising prevalence of obesity and chronic disease increases the need for dietetics services.1 It is predicted that by the year 2020 only 75% of the demand for nutrition and dietetics practitioners in the United States will be met.2 A potential barrier to increasing the size of the dietetics workforce is the shortage of internships.3 Approaches such as team teaching have been trialed in hospitals,4 and although such initiatives provide some increase in student training capacity, they are unlikely to meet total placement demand.5 There is a need to explore innovative models of clinical education outside the hospital setting. Student-assisted services in underserviced settings may address workforce shortages and increase internship capacity.

THE STUDENT-ASSISTED SERVICES MODEL

At the University of Canberra, Australia, a Student-Assisted Service (SAS) provides 200 hours of supervised practice as part of an accredited dietetics education program. This service is positioned within a multidisciplinary allied health clinic that includes both private practitioners and SAS. The dietetics service provides outpatient services and outreach services to residential aged-care facilities. The service uses a constructivist collaborative learning approach with two to three students running the clinic under the supervision of an experienced dietitian. Evaluation of student and client satisfaction is an important measure of the success of the SAS, and a mixed-methods approach, using both qualitative and quantitative data, was applied.

Student evaluations of 200 hours of supervised practice in the SAS (n=6/15) followed by 200 hours in a hospital (n=5/15), conducted by a 40-item anonymous online survey, showed the SAS to be similar to the hospital setting. Responses to open-ended questions highlighted the benefits of the SAS:

It was a good opportunity for me to improve my management and organizational skills as the clinic is totally handled by the students. (Student 1, SAS)

This placement really helped me to build my counseling skills. This is something you do not get much of an opportunity to do if both clinical placements are undertaken in an acute hospital setting. (Student 4, SAS)

Satisfaction with the SAS was assessed in the patient groups (outpatients and residents) and in the staff of residential aged care facilities. Thirty-one outpatients, representing 53 initial consultations at the SAS, completed a modified SERVQUAL scale that measures service quality as the difference between client expectations and perceptions.5 Of this population, most clients were female (67.7%), aged 21 to 30 years (32.2%), employed full-time (54.8%), referred for overweight/obesity management (58%), and had not previously seen a dietitian (35.4%). The overall SERVQUAL scores (mean±standard deviation) for expectation and perception were 5.88±0.61 and 5.94±0.69, respectively, with the highest possible score being 7. The GAP score, an indicator of service quality, was positive (0.18±0.67), indicating overall client satisfaction with the service.

Four focus groups and eight semi-structured interviews were held with 19 residents and 14 staff from two residential aged care facilities that received SAS care as their only form of dietetics support. Emerging themes showed the SAS included improved staff knowledge, communication, and provision of individualized dietetics care, exemplified in the following quote.

[The SAS] made us realize there is a place for dietitians in aged care. They play a really important role in maintaining people’s weight and nutrition. They’ve been really good. They can pass knowledge on to us so that we...
can deal with residents well (Participant 1, Residential Aged Care Staff Focus Group, Facility 2).

In the following quote, an aged care resident shares her experience with the SAS.

I was losing a lot of weight, I went down to 46 kg. That is why I was put on a [supplemental nutritional beverage]. I am gaining weight again, which is good…Apparently the last report said I was well-nourished. (Participant 2, Resident Interview, Facility 2)

CONCLUSIONS

Although the single-case study design and small sample size of participant groups does not support drawing generalized conclusions from the findings of this pilot study, the results do support the potential for innovative models of clinical education in underserviced settings that contribute to both workforce and internship shortages. The evaluation showed that the SAS model was able to meet the needs of patients and exceed expectations while providing a quality learning experience for dietitians in training. The question remaining is whether the SAS placements provide students with equal opportunities to meet required competencies. Community health settings are increasingly delivering more complex care because of increasing client acuity, and have been shown to enable students to develop comparable clinical competence to a hospital setting.9,10 This research project has gone on to seek expert opinion, in a dietetics Delphi study, about whether the dietetics clinical competencies can be demonstrated in the SAS model11 (and R. Bacon et al, unpublished data, 2014; http://www.hwainventory.net.au/story/323-feed-our-future-an-online-tool-for-dietitians).

Using a constructivist approach in underserviced settings has the potential to extend professional boundaries and may better equip graduates for the demands of the future workforce.12 More research is needed to measure the graduate outcomes of students who have completed supervised practice in the SAS and to consider their capacity to demonstrate flexibility, creativity, or innovation in their approach to practice.

References

4.3 Contribution of this manuscript

This case study supports the premise that non-hospital placements settings can provide valuable experiences for student dietitians to develop ICM competence, prepare for the future workforce and support the delivery of healthcare in underserviced settings. Outpatient clients attending the SAS were satisfied with the quality of service provided by student dietitians. Residents and staff from the aged care facilities serviced by the SAS reported positive experiences. The students who participated in this study were equally satisfied with the quality of their ICM clinical placement experiences in the SAS when compared to a traditional hospital placement.

The SAS demonstrates the potential to increase placement capacity both by exploring non-hospital settings for ICM placements and by using innovative models of clinical education. The SAS provides a clinical placement opportunity that exposes students to current growth areas in dietetics including private practice and aged care. The qualitative comments suggest that placements in the SAS setting may offer particular advantage in the development of foundational competencies in management and organisation within the context of ICM (Unit 8 DAA 2009). This study makes a pedagogical contribution to clinical education. Rather than using a traditional one-on-one supervision model, the SAS uses a constructivist collaborative learning approach. This approach offers the potential to extend professional boundaries and to equip graduates for the future workforce.
The published findings in this manuscript suggest that services like the SAS can help to meet the increasing demand for community-based dietetic services. The results are consistent with other papers showing that student involvement does not compromise service delivery (Burrows et al. 2013; Meek et al. 2013). The results identified the need for improvements in person-centred food service provision in the residential aged care facilities serviced by the SAS and strategies to improve interdisciplinary care in the community based multidisciplinary service.

This small case study does not provide generalisable results that can be applied to other non-hospital settings and innovative models of clinical education. The study measures the success of the service based on client satisfaction but does not consider either the health outcomes of clients or the learning outcomes of students. In Chapters 5 and 6 further research is required to determine if dietetic students are able to develop and demonstrate ICM clinical competence in non-hospital settings.
Chapter 5: Aged Care Facilities and Primary Health-care Clinics

Provide Appropriate Settings for Dietetics Students to Demonstrate Individual Case Management Clinical Competence.

**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.
FORM E: DECLARATION OF CO-AUTHORED PUBLICATION CHAPTER

For use in theses which include publications. This declaration must be completed for each co-authored publication and to be placed at the start of the thesis chapter in which the publication appears.

Declaration for Thesis Chapter 5

Declaration by candidate

In the case of Chapter 5 the nature and extent of my contribution to the work was the following:

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<td>Conception and design, acquisition of data, statistical analysis, interpretation, drafting of the manuscript and critical revision of the manuscript.</td>
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The following co-authors contributed to the work.

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Candidate’s Signature: [Signature]

Date: 25/9/2015

Declaration by co-authors

The undersigned hereby certify that:

1) the above declaration correctly reflects the nature and extent of the candidate’s contribution to this work, and the nature of the contribution of each of the co-authors.

2) they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;

3) they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;

4) there are no other authors of the publication according to these criteria;
(5) potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit; and
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5.1 Introduction to the manuscript

In Chapter 4, student and consumer satisfaction with the SAS model demonstrated the potential for non-hospital placements to provide high quality placement experiences, while at the same time contributing to dietetics care in underserviced areas. The extent to which Australian universities utilise non-hospital setting for ICM placement is not known. The question also remains as to whether student dietitians are able to develop and demonstrate ICM competencies in non-hospital settings. An understanding of current competency assessment practices to assess the performance of dietetic students as observed by supervisors during their ICM placements is helpful in determining the best method to answer this question.

The publication presented in this chapter includes data from Phases 2 and 3 of the research. The incorporation of the SAS into the clinical placement program at the University of Canberra was met with considerable resistance from the profession with the hospital setting perceived as the ‘gold standard’ for ICM placements. In line with the pragmatist philosophical framework of this thesis, the publication in Chapter 5 explores evidence to determine if students were able to develop and demonstrate ICM competencies in non-hospital settings. Using a sequential mixed method approach allowed a more comprehensive exploration of the applicability of non-hospital settings for ICM placements, with Stage 1 (a quantitative survey) providing a national context and informing the methods used in Stage 2 (a focus group incorporated within a modified Delphi study). Audio-visual recordings from the SAS, of authentic student-client consultations, informed the participants’ judgments made in Stage 2.
ORIGINAL RESEARCH

Aged care facilities and primary health-care clinics provide appropriate settings for dietetic students to demonstrate individual case management clinical competence

Rachel BACON,1 Lauren WILLIAMS1,2 and Laurie GREALISH2
1Nutrition and Dietetics, University of Canberra, Canberra, Australian Capital Territory, and 2Nutrition and Dietetics/Nursing, Griffith University, Gold Coast, Queensland, Australia

Abstract

Aim: The aims of this study were to: (i) determine the ways in which non-hospital placement settings are used for individual case management clinical placements in dietetic education and (ii) examine the extent to which students can develop individual case management clinical competencies in non-hospital placement settings.

Methods: A sequential mixed methods approach was used. Quantitative data were obtained from an online questionnaire conducted with placement coordinators from all 15 Australian universities with accredited dietetics programs. Qualitative data were obtained from a focus group with eight experienced clinical supervisors who had viewed 11 audiovisual recordings of student/dietitian encounters with clients in non-hospital settings and assessed them against entry-level competencies. Data were analysed using descriptive statistics and content analysis.

Results: Placement coordinators from 10 of the 15 accredited universities responded, with most universities (8/10) using hospitals for the majority of their individual case management clinical placements. Seven of the ten universities used non-hospital settings but only for a small proportion of students (≤25%) and for short durations (one to two weeks). The experienced clinical supervisors agreed that primary health-care clinics and residential aged care facilities provided appropriate practice settings for student dietitians to demonstrate individual case management clinical competencies.

Conclusions: To align with the national health-care agenda and workforce demands, this research supports the expansion of clinical placement settings to also include non-hospital settings. The influence of context on competency development requires adjustments to be made for the nuanced practice differences in these settings.

Key words: case management, clinical competence, nursing homes, primary health care.

Introduction

National health reform and health workforce development is central to meeting the needs of Australia’s current population, particularly in terms of the reallocation of the workforce to underserviced areas. The ageing population and the increases in chronic disease are driving a move towards a consumer-driven, integrated health-care system with an expanded role for interdisciplinary primary health-care services, including dietetics.

Clinical placement experiences prepare and influence graduates’ future careers. A practice hierarchy has been identified in dietetics, with a strong perception that the ‘gold standard’ for clinical training in individual case management (ICM) is the hospital setting. The accrediting body in Australia specifies that:

‘Ten to twelve weeks full-time (or equivalent, with a minimum of ten weeks) is essential to develop the skills required to meet the competency standards for safe practice in managing nutrition care of individuals. At least four weeks of this period should be undertaken in a clinical setting in a hospital where at least two full-time equivalent dietitians are employed. Placements within private practice and clinics not part of the public health system may also be undertaken provided they meet the supervisory and assessment requirements (p. 12).’

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Despite the ‘gold standard’ perception, there are limitations to placing students in the hospital setting. With decreasing length of patient stay and increasing patient complexity, the appropriateness of the hospital environment to develop competence in client-centred counselling is questionable. Clinical placement programs need to prepare graduates for employment in new and emerging areas of practice. Areas of growth in the dietetics workforce, rather than being in the hospital setting, include residential aged care, private practice and wellness programs. Clinical placements in the aged care setting have the potential to produce graduates with a greater understanding of ageing and aged care. The addition of aged care and primary health experience could provide the workforce flexibility critical to the national health reform agenda.

Student dietitians are required to demonstrate the National Competency Standards for Entry-Level Dietitians in Australia in order to graduate. Developed by the Dietitians Association of Australia (DAA), these standards comprised nine units of competency with Unit 4 pertaining directly to the practice area of ICM (Figure 1). Unlike other health disciplines, dietetics does not have a national assessment tool, with assessment processes subsequently within the purview of each university. Academic dietitians in Australia have called for more scholarship and debate relating to the role of clinical placements in the development of ICM competence in dietetics. This research aims to address this evidence gap by: (i) identifying the ways in which Australian tertiary dietetics programs are using non-hospital settings for ICM placements and (ii) examining the extend to which students can develop ICM competencies in non-hospital placement settings.

Methods

A sequential mixed methods approach was used to allow a more comprehensive exploration of the applicability of non-hospital settings for ICM clinical placements. Stage 1 provided a national context and informed the methods (sampling and research instrument) used in stage 2. A reference group was established with health sector, academic, regulatory, student and consumer representation to provide advice on the direction of the study and ensure its relevance to current practice. Feedback was provided on the scope of the project, the methodology and the interpretation of the results of the study. The University of Canberra’s Committee for Ethics in Human Research approved the study (CEHR 12-209) that conforms to the provisions of the Declaration of Helsinki. The methods and results will be presented sequentially for each stage of the study and then discussed together.

Method (stage 1): In December 2012, all 15 universities offering accredited dietetics programs were identified from the DAA website. Placement coordinators for the ICM placement programs at these sites were invited, via email, to participate in an online survey about their use of non-hospital settings and assessment practices for ICM placements. Participation was voluntary and confidential. Completion of the online survey implied consent. A

![National Competency Standards for Entry Level Dietitians in Australia](image)

**Figure 1** The Dietitians Association of Australia National Competency Standards for entry-level dietitians in Australia (2009).
follow-up telephone call was made to all participants to confirm their role in placement coordination and to clarify their understanding of the research project. The online survey consisted of demographic questions (two items) and a purpose built instrument—the Dietetics Placement Mapping Questionnaire (DPMQ: Figure 2).

Consultation was sought in the development of the DPMQ from three researchers familiar with competency assessment literature and practices and/or dietetic placement accreditation requirements to achieve content validity. Two university staff with experience in dietetics placement coordination pilot-tested the draft survey. This resulted in minor modifications to the survey. To maximise the response rate: (i) the DPMQ was designed to be user-friendly (set up with Qualtrics Survey Software—version 12018, 2005, Qualtrics, http://www.qualtrics.com) and quick (completed in less than five minutes); (ii) the covering email was personalised and outlined the aim and benefits of the research; and (iii) participants had five days to complete the DPMQ with a reminder email sent after 10 days providing an extended duration for completion. Data from completed surveys were exported from Qualtrics Survey Software to Excel (version 14.3.5, 2010, Microsoft Corporation, http://www.microsoft.com/) and analysed using descriptive statistics. Responses from open-ended questions were sorted into response category themes and counted to identify common themes.

**Method (stage 2):** Qualitative research is well suited to research questions that address emerging areas of practice and where controversial and inherently complex issues, such as competency assessment, can be elucidated.\(^\text{14}\) Stage 2 was conducted as part of a larger study involving a three-round modified Delphi study. The larger study used an online survey interspersed with controlled feedback and a focus group discussion to achieve consensus on 11 assessments of student/dietitian consultations as observed from audiovisual recordings. These consultations were pre-recorded with permission of all parties within a university clinic that provided outpatient clinics and services to aged care facilities. No validated dietetics ICM assessment tool was identified for use by clinical supervisors in stage 1. Unit 4 of the DAA National Competency Standards for Entry-Level Dietitians in Australia (Table 1) was therefore used as the criteria to assess the students’ performances.

Data from stage 1, demonstrating the key role played by clinical supervisors in the assessment of student competence during their ICM placements, supported the purposeful

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**Figure 2** Dietetics placement mapping questionnaire (DPMQ).
sampling used in stage 2. The 15 ICM placement coordinators in stage 1 were invited to nominate experienced clinical supervisors with currency in clinical dietetics and student supervision. Eight clinical supervisors were contacted, via email, and agreed to participate in the modified Delphi study. The clinical supervisors provided written consent for their participation and were paid an honorarium. The contributions of the clinical supervisors are reported collectively.

In round 2 of the modified Delphi study, the eight clinical supervisors were asked to identify any performance criteria from the Unit 4 Competency Standards that they felt could NOT be demonstrated in an outpatient setting or residential aged care facility. These responses formed the structured protocol used to direct the focus group discussion.

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Results

Results (stage 1): A response rate of 67% (10/15) was achieved for stage 1 with university representation covering all Australian states offering accredited dietetics programs. In total, 361 students were enrolled in the final year of these programs (mean = 36 ± 21.5). Accredited Practising Dietitians (APDs) employed by the health services played a key role in assessing student dietitians during ICM placements. A
designated clinical educator was reported by all but one of the universities. Clarifying comments suggested that in most cases, university faculty only became involved in the process of student assessment, when students had been identified as not meeting competency within the intended placement period (n = 3).

Most placement coordinators reported that multiple sources of evidence were used to explain their assessments of student competence. This included student reflections (8/10), portfolios (6/10), case presentations (written and oral) (6/10), workplace clinical assessments 3/10, peer assessments 2/10 and direct observations by clinical supervisors 10/10. Most (9/10) universities provided supervisors with assessment tools. Four different universities provided seven assessment tools. The assessment tools included individual nutrition counselling forms (n = 2), a casemix form (n = 1), a chart entry checklist (n = 1), a professional development assessment form (n = 1) and a clinical placement

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| 4.1 Undertakes screening and assessment to identify and prioritise those at nutritional risk | 4.1.1 Demonstrates awareness of the range of validated nutrition screening and assessment tools available, including strengths and limitations  
| 4.2 Determines nutritional status using assessment data | 4.1.2 Identifies and uses appropriate validated tools in nutrition screening and assessment  
| 4.3 Makes appropriate nutrition diagnoses | 4.1.3 Includes appropriate follow-up timeline  
| 4.4 Prepares plan for achieving management goals in collaboration with client or carer and other members of health-care team | 4.2.1 Interprets available documentation to identify problems  
| 4.5 Uses client-centred counselling skills to facilitate nutrition and lifestyle change and supports clients to self manage | 4.2.2 Assesses anthropometric and other body composition data  
| 4.6 Implements nutrition care plan in collaboration with client or carer and other members of health-care team | 4.2.3 Assesses clinical, biochemical and other biomedical parameters  
| 4.7 Monitors progress of the individual’s condition and care and adapts plan as necessary | 4.2.4 Assesses dietary intake, food habits, mental health and wellbeing issues, physical activity and lifestyle habits  
| 4.8 Documents and communicates all steps of the process | 4.3.1 Organises, interprets and prioritises data to undertake nutritional diagnoses  
| | 4.3.2 Refers to all available evidence to inform clinical judgement  
| | 4.3.3 Formulates and prioritises nutrition diagnoses  
| | 4.4.1 Determines realistic goals for nutritional management in collaboration with client and other members of healthcare team  
| | 4.4.2 Identifies nutrition outcome measures and performance indicators  
| | 4.4.3 Develops dietary prescriptions and formulates meal plans and feeding regimens consistent with nutrition goals  
| | 4.4.4 Communicates food service and supply needs of individual clients to appropriate persons  
| | 4.4.5 Considers discharge planning and/or referral to other services  
| | 4.5.1 Considers an environment conducive to effective counselling  
| | 4.5.2 Assists client to clarify issues, identify the barriers to resolution of the problem and identify appropriate goals and strategies  
| | 4.5.3 Negotiates client-oriented goals and strategies  
| | 4.5.4 Provides information and/or referral if necessary, and responds to client concerns  
| | 4.5.5 Evaluates process and outcomes of counselling with client and/or others including family members and carers  
| | 4.6.1 Selects the most suitable strategy in terms of feasibility and client outcome  
| | 4.6.2 Implements nutrition plan and a system for monitoring and review with client and other health-care team members  
| | 4.6.3 Promotes physical activity guidelines in care plan with client and other health-care team members  
| | 4.6.4 Participates in multi-disciplinary team activities (such as case conferencing) to achieve nutrition goals  
| | 4.7.1 Implements the evaluation strategies identified in the nutritional care plan  
| | 4.7.2 Gathers data throughout the care process so that an individual's progress can be monitored against performance indicators  
| | 4.7.3 Determines a timeline for follow-up of clients as necessary  
| | 4.8.1 Maintains clear and concise records, in accordance with the organisation’s policy and legal requirements, of all facets of the nutrition care process  
| | 4.8.2 Formulates unambiguous instructions for other personnel involved in the delivery of nutrition care  
| | 4.8.4 Communicates the nutrition care plan to other members of the health-care team as appropriate, including referring practitioners  
| | 4.8.4 Maintains statistics and other reports required of the organisation  

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assessments (summative) form (n = 3). In most instances, these forms were structured around the nutrition care process and used learning objectives rather than the competency standards. All forms included a tick box to rate performance and space for qualitative feedback. A four-point rated scale was used to consider the difficulty/cooperation of the client on both the nutrition counselling forms. One university did not supply their forms but indicated that they used multiple assessment tools including direct observations based upon Calgary Cambridge Guide to the Medical Interview, end of week feedback forms, and forms derived directly from the competency standards.

Most universities (n = 8) reported using hospital settings for the majority (≥75%) of their ICM placements. The most frequently reported non-hospital setting was an outpatient clinic on a hospital campus. In most instances, these settings were in an urban location, and used for short (one to two week) durations (Table 2). One university used a student-led clinic that provided outpatient services to aged care facilities, both in a rural and in an urban setting. One university indicated plans to modify their placement model: ‘We are looking at modifying this to include GP Super-clinics and future university-based clinics.’ Most universities (n = 7) reported using non-hospital settings for a small proportion of each student cohort.

Reasons provided for using the traditional hospital model for ICM placements included sufficient placements in hospital settings (n = 7), preference of the DAA (n = 4), student preference for hospital placements (n = 3), and not having explored non-hospital placement options (n = 1). Three placement coordinators commented that non-hospital settings did not offer students an equivalent experience to hospital settings, both in a rural and in an urban setting. One university indicated plans to modify their placement model: ‘We are looking at modifying this to include GP Super-clinics and future university-based clinics.’ Most universities (n = 7) reported using non-hospital settings for a small proportion of each student cohort.

**Results (stage 2):** In stage 2, one male and seven female clinical supervisors participated in the focus group. Most (five out of eight) had more than 10 years experience as a dietitian and more than six years experience in supervising students. Four had experience in an outpatient setting but only two had worked in a residential aged care facility.

In round 2 of the modified Delphi Study, all eight participants had agreed that all elements of ICM competency and their related performance criteria could be demonstrated in a residential aged care facility and that elements 4.2 (Determines nutritional status using assessment data), 4.3 (Makes appropriate nutrition diagnoses) and 4.6 (Implements nutrition care plan in collaboration with client or carer and other members of health-care team) could be demonstrated in an outpatient setting. The students’ documentation from each consultation was not included in the study and therefore the element of competency 4.8 (Documenting and communicating all stages of the process) could not be directly assessed. The clinical supervisors, however, agreed that this competency would be assessable in real-life outpatient and aged care settings. A summary of the clinical supervisors’ views from the focus group with regard to the opportunities to demonstrate the elements of competence 4.1, 4.4, 4.6 and 4.7 in an outpatient setting are outlined in Table 3.

Subtle differences in competency development in non-hospital settings, compared to hospital settings, emerged during the focus group discussion. The nuances emerged in relation to the emphasis on malnutrition assessment and the need for holistic assessment in aged care, and the focus on counselling skills and the requirement to complete the whole consultation in one sitting in outpatient settings.

Malnutrition screening and assessment was seen as an opportunity for student learning in the aged care setting. A number of participants also emphasised the need to look at the needs of aged care clients in a holistic way including client preferences and quality of life. Referring to the pre-recorded consultation between a student and an aged care client, participants commented:

> ‘We have been through this phase in dietetics where evidence based medicine has really been what’s on paper,'

### Table 2 Use of non-hospital placement settings for the ICM of clinical placements

<table>
<thead>
<tr>
<th>Clinical placement setting</th>
<th>Universities using the setting (n)</th>
<th>Location</th>
<th>Placement weeks x ± SD</th>
<th>Students x ± SD</th>
<th>Services provided at the clinical placements chosen by (n) universities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community health centre</td>
<td>3</td>
<td>Urban</td>
<td>x = 2 ± 1</td>
<td>x = 5.7 ± 3.5</td>
<td>Outpt = 3, Aged care = 0, District hospital = 0, Group Ed. = 2, Home visits = 3</td>
</tr>
<tr>
<td>Medicare local</td>
<td>0</td>
<td>Rural</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>University clinic</td>
<td>2</td>
<td>Urban</td>
<td>x = 5 ± 0</td>
<td>x = 1 ± 0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Rural</td>
<td>—</td>
<td>x = 1 ± 0</td>
<td>1</td>
</tr>
<tr>
<td>Outpt clinic-hospital setting</td>
<td>5</td>
<td>Urban</td>
<td>x = 1.5 ± 0.5</td>
<td>x = 17 ± 23.3</td>
<td>4</td>
</tr>
<tr>
<td>Residential aged care facility</td>
<td>2</td>
<td>Rural</td>
<td>x = 2.5 ± 0</td>
<td>x = 7 ± 1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Urban</td>
<td>x = 2 ± 0</td>
<td>x = 2 ± 0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Rural</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Developing ICM competencies in non-hospital settings

Table 3 Elements of competence with dissent

<table>
<thead>
<tr>
<th>Element</th>
<th>Clinical supervisor comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Undertakes screening and assessment to identify and prioritise those at nutritional risk</td>
<td>In practice, it is not the dietitian (rather nursing staff or nutritional assistants) who undertakes nutrition screening. An awareness and capacity to evaluate malnutrition screening and assessment tools (4.1.1) can be assessed at university. Malnutrition assessment tools are used in an outpatient setting but their relevance will depend on the casemix. In an outpatient setting, competent performance is demonstrated by a student’s capacity to determine the appropriateness of a malnutrition assessment tool using professionally recognised screening principles as a part of their overall nutrition assessment.</td>
</tr>
<tr>
<td>4.4 Prepares plan for achieving management goals in collaboration with client and carers and other members of the health-care team</td>
<td>If interpreted prescriptively, a student may not be able to demonstrate the performance criterion 4.4.4 (Communicates food service and supply needs of individual clients to appropriate persons). It was recommended that students should complete one placement block where they are required to work together with food service. In an outpatient setting, students are required to work with an open food supply.</td>
</tr>
<tr>
<td>4.6 Implements nutrition plan in collaboration with client or carer and other members of the health-care team</td>
<td>Outpatient settings do not provide the traditional model of multidisciplinary care; however, students can certainly develop competence in working as part of a healthcare team. Primary health-care settings may offer advantages in regard to inter-professional practice; however, sites need to be evaluated individually.</td>
</tr>
<tr>
<td>4.7 Monitors progress of the individual’s condition and care and adopts plan as necessary</td>
<td>Students need to conduct both initial and review consultations in an outpatient setting. It may be harder for students to access some nutrition care indicators, such as biochemistry, in non-hospital settings when compared to a hospital setting. Discharge planning appeared to be a competency that developed later in the placement. The second clinical placement should be selected to support the student’s demonstration of this competency.</td>
</tr>
</tbody>
</table>

Discussion

This study provides valuable insight into the practices currently used by Australian dietetics programs for ICM placements. It provides evidence that most universities are relying upon the hospital sector to provide the majority of the 10-week ICM placements in dietetic education programs. Despite HWA funding opportunities in exploring non-hospital sites, most universities reported using non-hospital settings for a small number of students and for short durations even though DAA only mandates four weeks in the hospital setting. The participants felt that students, academic staff and the professional association perceived disadvantage for students being placed in non-hospital settings. No rationale was offered by participants for this perspective.

The key finding from the focus group was the agreement by the experienced clinical supervisors that students can develop and demonstrate entry-level competence in ICM in non-hospital placement settings including residential aged care facilities and outpatient clinics. This result challenges the perception that the hospital setting is the ‘gold standard’ for clinical training. This is consistent with the findings from other disciplines. For example, within medicine, non-hospital placements have resulted in comparable student performances. A systematic literature review of medical students completing placements in community settings reported that the students exhibited a more holistic approach to health care, increased clinical proficiency scores, better mastery of rapport building and a more effective patient encounter routine.

what’s the review paper telling us—what’s all the evidence and forgetting that one of the other components of evidenced based medicine is patient preferences and what they want and I think this girl demonstrated a nice balanced response with evidence based medicine there. (Participant 2)

In the AV recordings in an outpatient setting, the students/dietitians demonstrated behavioural change techniques:

‘She did a few things really nicely, listening, active listening and the clarity in her goal setting was really evident.’ (Participant 7)

‘The other thing that was really good was how she was able to change track so when the whole thing about the moods came up she went and got the mood diary . . . that was listening to the patient and responding.’ (Participant 4)

The focus group highlighted that one of the challenges in working in an outpatient setting as opposed to the hospital or aged care setting is the need to conduct the whole consultation in one sitting. This prevents students from taking time to research a case or consult privately with their supervisors. In an outpatient setting, the reason for the referral may not be evident until the consultation, making it harder for the student to prepare. Students also have to transition directly from their data collection, through assessment to their treatment plan. The panel recommended scaffolding approaches such as prompts, questioning or ‘think-alouds’ to support the student’s learning in this setting.
Evidence for successful behaviour change no longer supports the traditional model where the dietitian is the expert who provides advice and instruction. Cant and Aroni highlighted the limited time allocated to the adequate development of communication and counselling skills in some dietetics programs. Through viewing and assessing the AV recordings of student/dietitian outpatient consultations, focus group participants perceived that this setting allowed the demonstration of competencies in client-centred counselling.

This study found that competency development was influenced by the context of the setting, with behaviour change skills likely to be developed in outpatient settings and malnutrition assessment likely to be demonstrated in residential aged care. As Ash and Phillips stated, different settings value different competencies to different degrees. In the aged care setting, the need to use an individualised approach to less restrictive diets influenced the clinical supervisors’ interpretation of the competency standards. These findings highlight the need to revisit clinical education curricula and consider other settings in addition to hospital sites in the ICM placement mix.

Combining hospital, outpatient and aged care settings in the one-placement mix provides students with a more varied experience. Deficiencies in transitional care during hospital discharge are evident particularly in the management of chronic disease. Theoretical knowledge of an integrated health-care system becomes more meaningful through experiential learning across the continuum of care. Competent work performance will demand the flexibility to move between practice settings. Additional practice settings provide students with the opportunity to reflect, create new knowledge (lifelong learning) and develop or transfer their practice.

There are limitations to this study. One-third of the Universities did not respond to the online survey despite design measures to maximise participation; however, at least one program from each of the Australian states participated. Dietetics is a relatively small health-care profession and the results provide a reasonable overview of current practices given the number of accredited dietetics programs nationally. The results from this study are exploratory and should be interpreted as offering expert opinion rather than indisputable fact.

Future research is required to: (i) explore new models of clinical education that equip graduates for the future demands of a consumer-led integrated health-care system; (ii) to gain a shared understanding of entry-level performance in non-hospital placements settings; (iii) to explore the implications of the use of different placement settings on graduate employment outcomes; and (iv) to determine the best ways to support new graduates in emerging areas of practice.

In order to produce competitive graduates, dietetics education needs to offer clinical placement programs that consider the demands for a flexible consumer-driven inter-professional workforce. This research has added to the body of knowledge supporting the expansion of ICM clinical placement settings to include non-hospital settings. This will require adjustments to consider the nuanced practice differences in these settings.

**Funding source**

This research was made possible due to funding made available by Health Workforce Australia, an Australian Government Initiative, as part of the 2012 National Clinical Supervision Fellowship Initiative. This research is supported by the University of Canberra as part of a doctoral thesis.

**Conflicts of interest**

Professor Lauren Williams is a member of the Australian Dietetics Council (ADC), the accrediting body of the Dietitians Association of Australia (DAA); however, the views stated in the article in no way represent the views of the ADC or DAA.

**Authorship**

RB was the main author and contributed to the conception and design; acquisition of funds; data collection, management, statistical analysis and interpretation; drafting and revision of the manuscript. LW and LG both provided research supervision assisting in the research design, funds acquisition and revision of manuscript.

**References**


2 Grady P. Advancing the health of our aging population: a lead role for nursing science. *Nurs Outlook* 2011; 59: 207–9.


9 Grealish L, Lucas N, Neill J, McQuellin C, Bacon R, Tred F. Promoting student learning and increasing organisational


5.3 Contribution of this manuscript

This publication provides evidence supporting the thesis that non-hospital clinical placement settings provide appropriate experiences for student dietitians to develop individual case management competence. Although most Australian universities use hospitals for ICM placements, the consensus of the panel of experienced supervisors was that students could develop and demonstrate ICM competence in outpatient clinics and aged care facilities with adjustments made for the nuanced practice differences. This finding has implications for increasing clinical placement capacity and the development of placement programs that better align with the workforce demand and healthcare agenda.

The results presented in this paper are not surprising, given that an assessment strategy developed to accompany the first edition of the DAA National Competency Standards for Entry Level Dietitians (Ash, 1995) used to assess ICM competencies included the assessment of a student’s/dietitian’s performance during a one-to-one consultation. It was argued at the time that this clinical encounter could occur in any practice setting including a hospital or outpatient clinic. The DAA Range of Variables Statements released with the Competency Standards revisions (DAA 2010) stated that ICM competencies can be demonstrated in ambulatory care settings.

The results presented in this paper are exploratory but provide some evidence to question whether the professional resistance to ICM placements in non-hospital settings is warranted. Rather than a hierarchical view, where hospital placements are seen as the ‘gold standard’, clinicians are encouraged to value the unique contribution made by
dietitians in different clinical contexts. The hospital setting only makes up a small part of the overall health care that people require and participate in over their life span. A range of ICM placement experiences is most likely to provide students with the opportunity to develop competence in all areas.

Advances in research and practice in the ICM setting, together with changes in the healthcare context, have implications for the optimal ICM clinical placement program. In the current hospital context of reduced length of patient stay and increasing patient complexity, this research suggests that ICM placements in an outpatient setting may favour the development and demonstration of the element of competence 4.5 (Uses client-centred counselling skills to facilitate nutrition and lifestyle change and support clients to self manage) over the hospital setting. Similarly, the aged care setting may favour the development of element competence 4.1 (Undertakes screening and assessment to identify and prioritise those at nutritional risk) over the outpatient setting.

This paper has highlighted the nuanced practice differences between ICM settings. As a consequence of their placement experiences individual students may have different learning trajectories, with different settings inevitably favouring different competencies to different degrees. Students who complete ICM placements in outpatient, aged care and hospital settings may require support to transfer their skills, knowledge and behaviours between different settings. Future research is required to gain a shared understanding of entry-level practice in different placement settings; to explore the
implications of the use of different placement settings on graduate outcomes and to determine the best ways to support graduates in emerging areas of practice.
Chapter 6: Credible and Defendable Assessment of Entry-Level Clinical Competence: Insights from a modified Delphi study.

FORM E: DECLARATION OF CO-AUTHORED PUBLICATION CHAPTER

For use in theses which include publications. This declaration must be completed for each co-authored publication and to be placed at the start of the thesis chapter in which the publication appears.

Declaration for Thesis Chapter 6

Declaration by candidate

In the case of Chapter 6 the nature and extent of my contribution to the work was the following:

<table>
<thead>
<tr>
<th>Nature of contribution</th>
<th>Extent of contribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conception and design, acquisition of data, statistical analysis, interpretation,</td>
<td>75</td>
</tr>
<tr>
<td>drafting of the manuscript and critical revision of the manuscript.</td>
<td></td>
</tr>
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</table>

The following co-authors contributed to the work.

<table>
<thead>
<tr>
<th>Name</th>
<th>Nature of contribution</th>
<th>Extent of contribution (%)</th>
<th>Contributor is also a student at UC Y/N</th>
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<tr>
<td>Lauren Williams</td>
<td>Research supervision assisting in the research design</td>
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<td>N</td>
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<tr>
<td></td>
<td>and critical revision of the manuscript</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laurie Grealish</td>
<td>Research supervision assisting in the research design</td>
<td>10</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>and critical revision of the manuscript</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maggie Jamieson</td>
<td>Supervision and critical revision of the manuscript</td>
<td>5</td>
<td>N</td>
</tr>
</tbody>
</table>

Candidate's Signature

Date 29/7/2015

Declaration by co-authors

The undersigned hereby certify that:

(1) the above declaration correctly reflects the nature and extent of the candidate’s contribution to this work, and the nature of the contribution of each of the co-authors.
(2) they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
(3) they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
(4) there are no other authors of the publication according to these criteria;
(5) potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit; and
(6) the original data are stored at the following location(s) and will be held for at least five years from the date indicated below:

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</table>

[Please note that the location(s) must be institutional in nature, and should be indicated here as a department, centre or institute, with specific campus identification where relevant.]

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<tr>
<td></td>
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</tbody>
</table>
6.1 Introduction to the manuscript

The results presented in Chapter 5 supported the expansion of ICM clinical placement settings to include non-hospital settings, after making necessary adjustments for the nuanced practice differences. Phase 3 (Chapter 6) of this thesis aims to explore the development of ICM clinical competencies in aged care and primary health care settings. The objectives are to determine: (1) which elements of competency and related performance criteria, as described by the DAA (2009) for ICM, can be achieved on placements outside the hospital setting; (2) whether supervisors were able to achieve consensus in their assessments of student performances of ICM competencies in these settings; and (3) if AV recordings of student-client encounters could be used to gain a shared understanding entry-level performance.

Consistent with the pragmatist philosophical framework of this doctoral thesis, this phase of the research aimed to emulate current competency-based assessment practices within the dietetics profession as reported in Phase 2 (Chapter 5). Rather than using pre-scripted student-client consultations, audio-visual recordings from the SAS of authentic consultations were assessed. The panel of experts was selected as clinicians who were currently provided with the responsibility by the profession to judge the competence of student dietitians during their ICM placements rather than based on their qualifications in assessment practices. Since Phase 2 did not identify a validated assessment tool for use by clinical supervisors, a research instrument based directly on the Competency Standards (DAA, 2009) was developed to compare the assessments made by the panel of supervisors.
The focus of the publication presented in Chapter 6 has evolved as a consequence of the research findings and explores the journey of the experienced clinical supervisors in reaching consensus and in gaining a shared understanding of entry-level practice. This paper explores the challenges of assessing competency during clinical placements where the students’ learning experiences and assessments cannot be standardised.
Credible and defensible assessment of entry-level clinical competence: Insights from a modified Delphi study

R. Bacon¹, L. Williams², L. Grealish² & M. Jamieson¹

Abstract

Background: During clinical placements, supervisors repeatedly assess health and medical students for competence. Quality assessment is dependent upon the supervisors having a rich understanding of entry-level standards and an assessment approach that is sufficiently dynamic to accommodate the changing healthcare system. This study aimed to assess whether consensus could be gained by supervisors when assessing the performance of student dietitians during clinical placements and to establish a shared interpretation of entry-level clinical competence.

Methods: A modified 3-round Delphi study with a focus group discussion was conducted with eight supervisors. Participants were required to assess the performance of student dietitians from audiovisual recordings of authentic student–client consultations in aged-care and outpatient settings.

Results: Consensus was achieved for 2/11 assessments after one Delphi round, 6/11 assessments after two rounds and 10/11 assessments after the third and final round. During the focus group discussion, the expert panel expressed a shared understanding of entry-level performance, however this was not transferred into a shared assessment of entry-level performance in the Delphi task.

Conclusions: Dialogue amongst supervisors leads to a more reliable interpretation of the competency standards. A shared responsibility for assessment, with continuous and open negotiation of meaning, is required to ensure quality assessments of entry-level practice.

Keywords: assessment, clinical placements, Delphi study, competence.

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Introduction

Clinical placements assist students to translate theoretical knowledge into practice (Hughes & Desbrow, 2010) and are a core component of health professional education curricula. In Australia, in the absence of evidence of the time required to attain competence, most accrediting bodies mandate the duration of clinical placements in health professions (National Health Workforce Taskforce, 2008). Student dietitians are required to complete 100 days of field placements, at least half of which are dedicated to developing individual case management or clinical competence, and entry-level competence is assessed by supervisors towards the end of clinical placements (DAA, 2011) based on the DAA (2009) National Entry-level Competency Standards for Australian Dietitians. Unlike some other health disciplines (Dalton, 2009; McAllister, Lincoln, Ferguson, & McAllister, 2006), dietetics does not have a nationally-validated assessment tool for use by supervisors (Palermo et al., 2014). The assessment tools used to assess competence during clinical placements remain within the purview of the universities (DAA, 2011), but the Dietitians Accreditation Manual states that “primary [placement] supervisors are responsible for verifying the final assessment of competence of students” (DAA, 2011, p. 13). A recent report by the DAA suggested that 10% of Australian dietetic students are assessed as failing to demonstrate entry-level competence in the allocated timeframe (Williams & Beck, 2011).

The difficulties inherent in assessing student competence in the workplace are well reported in the literature (Epstein & Hundert, 2002). Learning occurs within a socio-cultural context, and assessment is influenced by the student’s socialisation, the relationship between the student and the supervisor, personal factors and external factors (Levett-Jones, Gresbach, Arthur, & Roche, 2011). Competency is a human construct and is inherently subjective (Grealish, 2009). Judgement is an inevitable part of assessment, and therefore clinical supervisors need to be supported to make quality judgements, and supervisors need clarity to help them interpret assessment standards and holistic evidence-based assessment processes that consider the learning context (McAllister, Lincoln, & Ferguson, 2010). Evidence suggests that supervising clinicians have difficulty interpreting and applying the entry-level competency standards when assessing student performance (Lennie & Juwah, 2010), with a rich understanding of competence supporting quality judgement (McAllister et al., 2010). Johnsson and Hager (2008) found that competency development is dependent on the practice setting, its culture and learning experiences, and this needs to be considered in assessment practices. In addition, global assessments are more reliable (Govaerts, van der Vleuten, & Schuwirth, 2002), consider intangible competencies (Cox, 2000) and take into account the student’s capacity to integrate the units of competency (McAllister et al., 2010) and to transfer competence from one setting to another (Ash & Phillips, 2000). Resources to support assessments, such as visual representation of entry-level performance, may assist less experienced supervisors with assessments of student–patient encounters (Dalton, 2009). Credible assessments by multiple experts have been facilitated using audiovisual (AV) recordings of clinical encounters (Davies &
The DAA competency development taskforce used observations by two to six assessors of AV recordings of nutrition counselling sessions in their assessment strategy to evaluate clinical competency development (Ash, 1995).

An approach that supports a shared understanding of entry-level competence that is sufficiently dynamic to accommodate a changing healthcare system is required. Development of such an approach requires qualitative research to explore the assessment process (Govaerts & van der Vleuten, 2013). This study aimed to use audiovisual (AV) recordings of authentic client consultations to assess whether consensus could be gained by supervisors when assessing the performance of student dietitians during clinical placements and to establish a shared interpretation of entry-level clinical competence.

**Method**

A 3-round modified Delphi using online questionnaires interspersed with controlled feedback and a focus group discussion was used to achieve consensus on the global assessments of competence of 11 student/dietitian consultations with clients. These interactions were observed from AV recordings (see Table 1). The Delphi method is a research technique used to establish a consensus of opinion by a panel of experts in order to address a lack of agreement (Powell, 2003). The modified-Delphi method has been used in health and education research to allow participants to make independent assessments without pressure to conform to the opinions of more dominant members (Bowles, 1999). Therefore, it is appropriate to use a modified-Delphi technique that includes a face-to-face meeting to enable controversial issues to be elucidated (Brace-Govan, Farrell, Joy, Luxton, & Davey, 2011). Descriptive statistics are traditionally used in Delphi studies. Median and range are appropriate for ordinal data and expose errors related to outliers (von der Gracht, 2012). The definition of consensus (Table 1) must also align with the Delphi study’s purpose and research design (Powell, 2003).

Approval for this study was provided by the University of Canberra Committee for Ethics in Human Research (CEHR 12-209). A reference group with representatives from the health, academic, regulatory, student and consumer sectors was established to provide advice on the direction of the research and ensure its relevance to current practice. Feedback was provided on the scope of the study and the methodology.

In 2012, clinical placement coordinators of the 15 accredited dietetics programs in Australia were approached to nominate credible dietitians with experience and currency of practice in clinical dietetics and student supervision. The nominated supervisors were contacted, via email, and invited to participate in the study. Eight supervisors, representing all states/territories with accredited programs, participated in the research after providing written consent and receiving a small honorarium.

Eleven purpose-developed AV recordings of authentic student or dietitian consultations with clients were recorded. The consultations in this study occurred within a student-led university clinic that provided outpatient clinics and outreach services to aged-care facilities. Unobtrusive AV recording is part of the regular teaching practices within these clinics, and written consent was obtained from all people recorded, with minimal editing performed to decrease the time taken to view the recordings, while preserving
## Table 1

*The Modified-Delphi Study*

### Round 1 (4 weeks)

<table>
<thead>
<tr>
<th><strong>Method</strong></th>
<th>Supervisors independently assessed each AV recording using the assessment processes they routinely used then completed the research assessment questionnaire.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analysis</strong></td>
<td>VAS ratings were recorded as raw scores. Consensus was achieved when all ratings fell within a 3-point range. RB used thematic analysis to synthesize the qualitative comments in Round 1.</td>
</tr>
<tr>
<td><strong>For opinion responses:</strong></td>
<td>Themes were listed.</td>
</tr>
<tr>
<td><strong>For justification responses:</strong></td>
<td>Themes were categorized into qualifiers, reinforceers and negators.</td>
</tr>
<tr>
<td><strong>For descriptive responses:</strong></td>
<td>Low inference descriptions were used to capture the tone of the responses.</td>
</tr>
<tr>
<td><strong>Feedback</strong></td>
<td>RB prepared a summary report for each AV recording that was provided to participants prior to completing Round 2.</td>
</tr>
</tbody>
</table>

### Round 2 (4 weeks)

<table>
<thead>
<tr>
<th><strong>Method</strong></th>
<th>Supervisors revised their global assessments for the students’ performance where consensus had not been reached.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analysis</strong></td>
<td>Quantitative data was analysed on Qualtrics using descriptive statistics (median, range).</td>
</tr>
</tbody>
</table>

### Focus Group

<table>
<thead>
<tr>
<th><strong>Method</strong></th>
<th>RB led the discussion together with a research assistant who acted as scribe. A structured protocol informed by Round 2 considered inconsistencies in assessments where consensus had not been achieved. The expert panels’ experience with the research assessment questionnaire was explored. The discussion was audiotaped and transcribed.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analysis</strong></td>
<td>RB and the scribe independently prepared a summary report with consensus in the two reports achieved. Thematic analysis was later conducted on the transcript using van Manen’s (1984) highlighting approach. Transcripts were analysed independently by RB and the research assistant.</td>
</tr>
<tr>
<td><strong>Panel feedback</strong></td>
<td>Participants were provided with the results from Round 2. A summary of the focus group discussion was provided to participants.</td>
</tr>
</tbody>
</table>

### Round 3 (2 weeks)

<table>
<thead>
<tr>
<th><strong>Method</strong></th>
<th>Supervisors revised their original global assessment when consensus had not been reached and provided a global assessment of an additional AV recording of a new graduate consultation. Related extracts of the client’s medical notes and/or footage from the AV recordings were embedded in the survey, providing evidence to assist supervisors in their assessments. Qualitative questions were also included that sought further clarification in regard to entry-level performance. Demographic data about the expert panel was also collected.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analysis</strong></td>
<td>Quantitative analysis (as per Round 1): Thematic analysis was used to analyse the qualitative responses using van Manen’s (1984) highlighting approach. Responses were analysed independently by RB and the research assistant. Themes across all three rounds were pooled and reported together. Direct quotes were used as data to support the identified themes.</td>
</tr>
</tbody>
</table>
the authenticity of the consultations. Nine of the consultations were in the primary-care setting and two were in the aged-care setting. Eight were initial consultations and two were reviews. Three students appeared in more than one AV recording. The topics of the consultations represented a varied case-mix, including malnutrition, overweight/obesity, nutritional adequacy (vegan diet), sports nutrition, food intolerance, hypercholesterolemia, diabetes and oncology (see Table 2). Seven students were recorded during Weeks 1–5 of their clinical placement and two in Weeks 6–10. Two practitioners, one a recent graduate and the other with five years’ experience, were also recorded in the same setting. These recordings were made available to the supervisors for the duration of the study via a password protected private website. All recordings were deliberately presented to the supervisors as student-led consultations, with the consultations with qualified dietitians deliberately included to provide a validity check of the ratings.

Table 2
Global Ratings of Student Performances

<table>
<thead>
<tr>
<th>AV recording number</th>
<th>Placement</th>
<th>Settings</th>
<th>Case type</th>
<th>Consultation type</th>
<th>Round 1</th>
<th>Round 2</th>
<th>Round 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VAS scores: Raw (non-consensus) or range &amp; median (consensus)</td>
<td>Range 1–3</td>
<td>Median 2</td>
</tr>
<tr>
<td>AV 5</td>
<td>Weeks 1–5</td>
<td>Outpatient clinic</td>
<td>Obesity</td>
<td>Initial</td>
<td>1, 1, 2, 2, 3, 3, 4, 6</td>
<td>Range 2–4</td>
<td>Median 3</td>
</tr>
<tr>
<td>AV 9</td>
<td>Weeks 1–5</td>
<td>Outpatient clinic</td>
<td>Oncology</td>
<td>Initial</td>
<td>2, 2, 3, 3, 4, 4, 5, 6</td>
<td>Range 2–4</td>
<td>Median 3</td>
</tr>
<tr>
<td>AV 1</td>
<td>Weeks 6–10</td>
<td>Outpatient clinic</td>
<td>Sports nutrition (clinically complex)</td>
<td>Initial</td>
<td>2, 3, 4, 4, 5, 6, 6, 7</td>
<td>3, 3, 4, 5, 6, 5, 6, 7+</td>
<td>Range 4–6</td>
</tr>
<tr>
<td>AV 7</td>
<td>Weeks 6–10</td>
<td>Outpatient clinic</td>
<td>Vegan diet (socially complex)</td>
<td>Initial</td>
<td>4, 4, 4, 5, 5, 7, 7*</td>
<td>Range 4–6</td>
<td>Median 5</td>
</tr>
<tr>
<td>AV 2</td>
<td>Weeks 1–5</td>
<td>Outpatient clinic</td>
<td>Diabetes (Type 2)</td>
<td>Initial</td>
<td>1, 1, 2, 3, 4, 5, 7, 7+</td>
<td>2, 3, 3, 3, 3, 4, 4, 6</td>
<td>Range 4–6</td>
</tr>
<tr>
<td>AV 4</td>
<td>Weeks 6–10</td>
<td>Aged care</td>
<td>Malnutrition/Diabetes</td>
<td>Review</td>
<td>4, 5, 6, 6, 7, 7, 7</td>
<td>4, 5, 6, 6, 6, 6, 6, 7</td>
<td>Range 5–7</td>
</tr>
<tr>
<td>AV 3</td>
<td>Weeks 1–5</td>
<td>Aged care</td>
<td>Malnutrition/Diabetes</td>
<td>Review</td>
<td>4, 4, 6, 6, 7, 7, 7+</td>
<td>Range 5–7</td>
<td>Median 5</td>
</tr>
<tr>
<td>AV 8</td>
<td>Weeks 6–10</td>
<td>Outpatient clinic</td>
<td>Food-Intolerance (clinically complex)</td>
<td>Initial</td>
<td>4, 4, 5, 6, 7, 7, 7+</td>
<td>4, 5, 5, 5, 5, 6, 7, 7</td>
<td>Range 5–7</td>
</tr>
<tr>
<td>AV 10</td>
<td>Weeks 6–10</td>
<td>Outpatient clinic</td>
<td>Hypercholesterolemia/Overweight</td>
<td>Initial</td>
<td>4, 5, 6, 6, 6, 6, 7</td>
<td>Range 5–7</td>
<td>Median 6</td>
</tr>
<tr>
<td>AV 11</td>
<td>New graduate dietitian</td>
<td>Outpatient clinic</td>
<td>Overweight</td>
<td>Initial</td>
<td>Range 7–7+</td>
<td>Median 7+</td>
<td></td>
</tr>
<tr>
<td>AV 6</td>
<td>Experienced dietitian</td>
<td>Outpatient clinic</td>
<td>Obesity/Depression</td>
<td>Initial</td>
<td>Range 7–7+</td>
<td>Median 7+</td>
<td></td>
</tr>
</tbody>
</table>

* Only 7 responses were recorded for these surveys
The theoretical construct for competency-based assessment in dietetics (Ash & Phillips, 2000) is based on Dreyfus and Dreyfus’ (1980) model of skills applied to the health context by Benner (1984). This model presents competence as part of a continuum of learning from novice to expert rather than as an end-point of competent or not yet competent (Ling, 1999). The DAA National Standards for Entry-level Competence describe the job roles of dietitians and are intended to be assessed together as an integrated whole using practice tasks rather than as a check list of functional skills that must be demonstrated (Ash & Phillips, 2000).

In a previous study, no validated clinical dietetic competence tool was identified for use by clinical supervisors (Bacon, Williams, & Grealish, 2014). A questionnaire to assess the students/dietitians performance was therefore developed based on Unit 4 of the National Competency Standards for Entry-level Dietitians (DAA, 2009), which details the eight individual case management elements of competencies (Figure 1) and the behavioural descriptors (Figure 2) used in speech pathology by McAllister et al. (2006). The behavioural descriptors support competency-based assessments that consider the practice setting, the

* The behavioural descriptors included above are described in Figure 2.

Figure 1. Global assessment of competency use for assessment questionnaire.
Figure 2. Behavioural descriptors of student competency.
complexity of the client and the student's level of experience. These descriptors inform the visual analogue scale (VAS) and have been previously shown to rate performance in a predictable manner (McAllister, Lincoln, Ferguson, & McAllister, 2011).

The questionnaire developed for this study included: (1) a VAS and a qualitative description providing a global assessment of performance (Figure 1), (2) a VAS item and qualitative description of performance for each element of competency within Unit 4, (3) a description of entry-level performance for each element within Unit 4, (4) feedback to the student about their performance in the client consultations and (5) strategies to support the student's learning. The reference group and two academics with expertise in health professional competency-based assessment were consulted in the development of the questionnaire, and the questionnaire was pilot-tested with two clinical educators to test for readability, clarity of instruction and face validity, and minor modifications were made. Round 1 of the modified Delphi commenced in February 2013. The supervisors used the questionnaire online through the private website. Details of the modified-Delphi study, including method, data analysis and panel feedback, are provided in Table 1.

Results

Five out of eight supervisors had more than 10 years’ experience as a dietitian and more than six years’ experience in supervising students on clinical placements. Four supervisors had experience of working in an outpatient setting, but only two supervisors had worked in a residential aged-care facility. All eight supervisors participated in Round 1, Round 2 and the focus group, and seven participated in Round 3. Table 2 shows the VAS ratings by each supervisor for each student/dietitian’s performance over the three rounds of the modified-Delphi study. Although the data was analysed to explore patterns in the VAS scores based on assessor characteristics, no significant findings emerged.

Three themes emerged from the qualitative data: (1) the qualitative descriptions made by the clinical supervisors in Round 1 reflected the same variation evident in the VAS scores; (2) through the Delphi process, supervisors’ assumptions, observations and the influence of their experience became apparent; and (3) the Delphi process enabled supervisors to gain a shared understanding of entry-level competence.

Theme 1: Qualitative descriptions in Round 1 reflected the variation in VAS scores

The global qualitative descriptions for individual students’ performances in Round 1 varied considerably between assessors, reflecting the variations found between the VAS scores. The following two comments were made about AV Recording 2 of a student in clinical weeks 1–5 by a supervisor who gave a VAS rating of 1 and another supervisor who gave a rating of 7, respectively.

Didn't build rapport. Lacked confidence and clarity with data collection. Left long pauses while writing notes. Took a long time to collect data, particularly diet history, was not concise. Did not give a good clear assessment of patient. Good to test patient’s prior knowledge of diabetes. Diet–disease relationship not all that clear (although good
Theme 2: Through Delphi process supervisors’ assumptions, observations, and the influence of their experience became apparent

Supervisors made different assumptions about when to assess student’s competence. One supervisor felt that although complex cases were good for student learning, such cases did not provide a suitable context to assess entry-level performance:

I think it is great practice. I mean, if that was a day you were choosing to do an assessment, you might at the end say let’s not use that one because it is so challenging on a number of levels and it’s still good skills. (Supervisor 6, focus group)

Another supervisor commented that the behavioural descriptors given as part of the VAS rating system were helpful for complex cases, to interpret student performance in light of the context:

I used it especially for some of those people when I wasn’t sure they were entry-level intermediate. I went back to the criteria and used the criteria to decide. (Supervisor 5, focus group)

In their qualitative comments, some supervisors focused on the details that needed improvement, such as this comment by a supervisor who gave a VAS rating of 6 for the performance of a student in weeks 1–5 of their placement, whereas another supervisor focused on the key outcomes achieved by the student in the same consultation and gave a VAS rating of 7. The supervisor who gave the VAS rating of 6 commented:

I thought the student needed to improve the commencement of the interview—building rapport and communication style … She needed to quantify the weight loss, do an SGA and identify a weight goal. (AV 3, supervisor 4, Delphi Round 3)

The other supervisor noted:

She demonstrated the ability to use client counselling; she implemented change in collaboration with the client; she drew justifiable conclusions from the data, and she was clear, concise and appropriate with the client. I feel she was at entry-level. (AV 3, supervisor 3, Delphi Round 3)

Consideration of the practice setting influenced the qualitative descriptions made by the supervisors. The following focus group comment was about an encounter in the aged-care setting.
She gave her a fairly clear assessment … like, your weight is stable so it looks like you are eating enough, and your BGLs [blood glucose levels] are well controlled so considering your age and that you are in an aged-care facility, keep doing what you’re doing. (AV 4, supervisor 8, focus group)

In the focus group, supervisors reported that their assessments were influenced by the observations of others in the feedback report.

I actually didn’t notice that until I read your comment, so I watched it again and I thought she said she had a breast cancer and she has lost weight since then. (AV4, supervisor 4, focus group)

The supervisors’ professional experience influenced their assessments.

Well, it was me who wrote down the breast cancer thing [qualitative description, Delphi Round 1] … I don’t know and it was a bit unclear and I guess for me I work in oncology at the moment so I wanted that followed up a bit more. (AV 4, supervisor 7, focus group)

During the focus group, supervisors reflected on the influence of their personal experiences and self-awareness of their own development since graduation.

I think it is important to remember that these are entry-level practitioners, and they should not be expected to be perfect or like us. (Supervisor 6, focus group)

Theme 3: The Delphi process supported a shared understanding of entry-level competence

In Round 1 of the modified Delphi, supervisors referred to the Unit 4 performance criteria to provide their qualitative descriptions of entry-level performance in clinical dietetics. In the focus group discussion, the supervisors expressed a common understanding of describing entry-level performance in global terms that included a demonstration of the dietetic process, an understanding of their scope of practice and the capacity for self-reflection and lifelong learning. However, supervisors in the focus group questioned their ability to clearly assess attainment of entry-level performance in actual clinical encounters.

You might get a placement where you are doing lots of oncology, or you might get renal and get good at that. I think you just need the skills in how to keep learning. (Supervisor 7, focus group)

I think what is tricky is the standard to which we expect them to do these things. I mean, I agree I think we expect they show some ability to do all of them [the performance criteria], but where is that grey line … At entry-level, I would have known the basics, but how do we define it? (Supervisor 6, focus group).

Table 3 shows the qualities the supervisors’ described in their written comments in Round 3 of the Delphi, when asked to discern whether a student was at entry-level.
This research provides insight into the way that supervisors assess whether students demonstrate clinical competencies in client consultations. After the first round of the modified-Delphi study, there was little consistency in the assessment ratings or descriptions made by supervisors about the performances of the student dietitians. This variation in assessments is consistent with other studies of work-based assessment that report low inter-rater reliability (Albanese, 2000). By the end of the third round, however, the supervisors had achieved consensus in their assessments of all but one of the consultations, where the scores ranged from 4 to 7 (from a maximum score of 7 or above).

This research has resulted in a shared conceptual understanding of entry-level competence amongst the supervisors. They agreed that, at entry-level, the students should be able to recognise the scope of practice in which they were able to provide dietetic care comprehensively and with clarity. The supervisors supported the use of the behavioural descriptors and the VAS scale system when making their assessment of performance. In fact, all supervisors assessed the two qualified dietitians’ performance in the client consultations as entry-level or above in the first modified-Delphi round, providing a measure of validity to the assessment instrument used in the study.

The supervisors’ theoretical understanding of entry-level performance, however, was applied inconsistently when assessing the students’ performance in client consultations. As a panel, the supervisors struggled to identify the point at which a student reach “entry-level”. This is not surprising as the development of competence is a journey, not a destination, and entry-level marks a grey-line in development between the stages.

<table>
<thead>
<tr>
<th>Stage of development</th>
<th>Approaching entry-level</th>
<th>Entry-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualities evident in the student's performance</td>
<td>Completes the majority of the work independently and competently. Demonstrates professionalism.</td>
<td>Safe, professional and independent. Able to work within their scope of practice.</td>
</tr>
<tr>
<td></td>
<td>Collects meaningful data but lacks detail.</td>
<td>Provides comprehensive data collection—qualified and quantified.</td>
</tr>
<tr>
<td></td>
<td>Provides an accurate and safe assessment but lacks clarity.</td>
<td>Provides qualitative and quantitative assessment.</td>
</tr>
<tr>
<td></td>
<td>The student negotiates appropriate goals but these need to be more specific and measurable.</td>
<td>Negotiates clear goals and a specific plan.</td>
</tr>
<tr>
<td></td>
<td>Provides appropriate advice but needs to improve the structure and organisation of the education.</td>
<td>Great flow and structure.</td>
</tr>
<tr>
<td></td>
<td>Uses client-centred counselling skills.</td>
<td>Uses client-centred counselling skills and individualised education, and motivates the client.</td>
</tr>
</tbody>
</table>
of beginner (labeled intermediate in McAllister et al. (2006) behavioural descriptor system) and competent (Benner, 1984). Given that 10% of students fail to reach clinical competence, this research raises concerns about the fairness of current assessment processes (Williams & Beck, 2010). Credible and defensible assessment processes may help to minimise the inconsistency in supervisors’ judgements of entry-level.

In this study, the sharing of assessments and dialogue between supervisors supported them in reaching consensus in their assessments. The AV recordings used in this study provide visual representations of performance. Visual representations can be used by less experienced supervisors to gain an understanding of expected standards of performance during placement (Dalton, Keating, & Davidson, 2009). Through the modified-Delphi process, supervisors identified and clarified assumptions and learned from the observations and experience of one another. A heightened awareness of the influence of their own experience and expertise on their judgement became apparent. This is consistent with the constructivist–interpretivist approach towards work-based assessments proposed by Govaerts and van der Vleuten (2013), where they advocate for an “interpretive community” where supervisors are able to articulate their own values and assumptions underlying their judgements, engage in critical dialogue and reconsider their assessments in the light of these negotiations.

The methods used in this study are robust. Supervisors’ assessments of students’ performance during clinical placements are highly valued in practice for determining a student’s readiness to enter the profession (McAllister et al., 2011). Global assessments (Chapman, 1998; Cox, 2000; Govaert et al., 2002) by multiple assessors (Davies & Clark, 2004) are seen as supporting quality assessments, and authentic assessments are considered the “gold standard” for determining competency to practise (Eraut, 1994; McKinley, Fraser, & Baker, 2001). By incorporating the previously validated behavioural descriptors and VAS scales developed by McAllister et al. (2006), the learning context was considered. The assessment process was validated by the assessment of the dietitians’ performance, with the reference group providing expertise and incorporating the perspectives of key stakeholders. The credibility of the study was improved by providing detail on the selection of supervisors, data collection procedures and identification of consensus level (Powell, 2003). The supervisors were nationally representative, and the independent nomination of expert assessors attributed credibility to participant selection. The use of eight assessors of a student’s performance is considered rigorous in comparison to similar research studies (Ash, 1995).

This research is limited by assessments being made based on a single observable performance for some students rather than multiple sources of evidence across the duration of the placement (Schuwirth & van der Vleuten, 2003). The panel of supervisors agreed that the use of AV recorded consultations provided insufficient evidence to assess the element of competency 4.8—documents and communicates all steps of the process. In addition, the Delphi approach has been criticised as providing a normative rather than an informational influence (von der Gracht, 2012). These results should, therefore, be interpreted as offering an expert opinion rather than indisputable fact. No prerequisite requirement for any formal education in assessment was mandated for participation.
More evidence is required to support the use of assessment panels during clinical placements and the value of a professional interpretive community to gain a shared understanding of entry-level performance. Further research may also consider the career implications of clinical placement assessments. How does a “failed” clinical placement impact on the student? For instance, is their assessment outcome reflective of their later contribution to the health profession?

**Conclusion**

This paper highlights the issues of judgment and subjectivity in the assessment of health professional competence. It acknowledges how interpretation of student performance is influenced by observations, experience and assumptions. It also contributes evidence to reframe clinical assessments, moving away from notions of objectivity, reliability and validity towards notions of credibility and defensibility.

There is value in considering the role of panels in the assessment of student competence during clinical placements. The supervisors in this study were generally able to reach consensus in their assessments and move towards a shared understanding of entry-level performance through dialogue. Credentialing agencies should call for regular comparison meetings of placement assessors within tertiary programs and across accredited university programs to ensure the fairest and highest quality assessment of entry-level performance.

**Statement of Reflexivity**

The qualitative research included in this paper 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 (RB) am an academic in a Masters of Nutrition and Dietetics program. In this role, I am responsible for the clinical placement program, including the establishment of the student-led dietetics clinics where the consultations were recorded for this study. Prior to my appointment, I worked as a dietitian for 15 years, predominantly in the clinical field, and for the last seven years specifically in clinical education. I know all the students and some of the dietitians who were participants in this study. Therefore, there is a risk of subjectivity in data collection and interpretation. Understanding this risk, I have taken care to ensure the results have been independently verified. It is only by accurately understanding the experiences of the participants that I could gain sufficient insight to assist supervisors to achieve more credible and defensible assessments, therefore, ultimately benefiting our students and the profession.

**Acknowledgements**

We would like to thank the participants, the reference group and Amy Haughey for her contribution as a research assistant.

This research was made possible due to funding from Health Workforce Australia, an Australian Government Initiative, as part of the 2012 National Clinical Supervision Fellowship Initiative. This research is supported by the University of Canberra as part of a doctoral thesis.
ASSESSMENT OF CLINICAL COMPETENCE

References


Bacon, R., Williams, L., & Grealish, L. (2015). Aged care facilities and primary health-care clinics provide appropriate settings for dietetic students to demonstrate individual case management clinical competence. *Nutrition & Dietetics, 72*(1), 54‒62.


ASSESSMENT OF CLINICAL COMPETENCE


6.3 Contribution of this manuscript

This research has raised concerns with current assessment practices within the dietetics profession, highlighting the subjectivity of assessment practices during ICM placements. These findings are consistent with a recent report on competency assessment practices within the dietetics profession that states,

“Current assessment in all practice-based settings was reported to be subjective and inconsistent, largely because of variations in standards across sites and between educators or supervisors. The graduates expressed the view that students, supervisors and educators, and the universities all need to be clear about what an entry-level practitioner ‘looks like’ in order to create appropriate learning opportunities and for fair and transparent assessment of competence.” (Palermo et al. 2014b, p.20).

Through these research findings, a reframing of assessment terminology, from the positivist notions of objectivity, reliability and validity, and towards a more interpretivist philosophy that evaluates the credibility and defensibility of the assessment appears to be required. The approach taken in this publication offers a way to achieve greater clarity around the assessment of entry-level competence in all ICM settings. Through dialogue, the supervisors’ assumptions, observations and the influence of their experience on their assessments became apparent. The Delphi process, using audio-visual recordings of nutrition consultations, supported supervisors to gain a shared understanding of entry-level competence and achieve consensus in their assessments.
The findings of this research indicated that supervisors need professional development in assessment practices. The need for further studies into the use of assessment panels during placements and the value of a professional ‘interpretive community’ to gain a shared understanding of entry-level competence is established. In Phase 4 the research from the early phases together with a focused literature review will be used to develop a web-based program to support clinical supervisors in ICM assessment practices.
Chapter 7: Competency-Based Assessment for Clinical Supervisors: Design-Based Research on a Web-Delivered Program

FORM E: DECLARATION OF CO-AUTHORED PUBLICATION CHAPTER

For use in theses which include publications. This declaration must be completed for each co-authored publication and to be placed at the start of the thesis chapter in which the publication appears.

Declarations for Thesis Chapter 7

Declaration by candidate

In the case of Chapter 7 the nature and extent of my contribution to the work was the following:

<table>
<thead>
<tr>
<th>Nature of contribution</th>
<th>Extent of contribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conception and design, acquisition of data, statistical analysis, interpretation, drafting of the manuscript and critical revision of the manuscript.</td>
<td>75</td>
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The following co-authors contributed to the work.

<table>
<thead>
<tr>
<th>Name</th>
<th>Nature of contribution</th>
<th>Extent of contribution (%)</th>
<th>Contributor is also a student at UC Y/N</th>
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<tr>
<td>Lauren Williams</td>
<td>Research supervision assisting in the research design and critical revision of the manuscript</td>
<td>10</td>
<td>N</td>
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<td>Laurie Grealish</td>
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<td>N</td>
</tr>
<tr>
<td>Maggie Jamieson</td>
<td>Supervision and critical revision of the manuscript</td>
<td>5</td>
<td>N</td>
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Candidate’s Signature

Date: 29/7/2015

Declaration by co-authors

The undersigned hereby certify that:

1. the above declaration correctly reflects the nature and extent of the candidate’s contribution to this work, and the nature of the contribution of each of the co-authors.
2. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
3. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
4. there are no other authors of the publication according to these criteria;
(5) potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit; and
(6) the original data are stored at the following location(s) and will be held for at least five years from the date indicated below:

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[Please note that the location(s) must be institutional in nature, and should be indicated here as a department, centre or institute, with specific campus identification where relevant.]

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7.1 Introduction to the manuscript

Chapter 6 raised concerns with competency-based assessment practices currently used within the dietetics profession, highlighting the subjectivity and inconsistency. Greater clarity is required for clinical supervisors on the definition and application of the competency standards within the dietetics profession. In particular, supervisors need to be supported to gain a shared understanding of entry-level practice. A pragmatic approach to addressing this concern was to develop a web-based professional development program for clinical supervisors, a solution that transcends time and geographical boundaries.

This chapter integrates the literature review on competency-based assessment presented in the introduction to this thesis and the research presented in Chapter 3-5. Together this is used to inform the development of a web-based professional development program to support clinical supervisors to use credible and defensible assessment practices during ICM placements. This publication uses a design-based research approach presenting the national consultation that informed the prototype development; the formative feedback and refinement; and the pilot-test, evaluation and redevelopment.

The constructivist program combines self-paced problem-based learning, reflection, and collaboration with video-based learning material. The AV recordings from the SAS and the corresponding assessments from the panel of experienced supervisors (outcomes from Phase 3 of the research) provide the foundational material for the program case studies.
Competency-Based Assessment for Clinical Supervisors: Design-Based Research on a Web-Delivered Program

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Abstract

Background: Clinicians need to be supported by universities to use credible and defensible assessment practices during student placements. Web-based delivery of clinical education in student assessment offers professional development regardless of the geographical location of placement sites.

Objective: This paper explores the potential for a video-based constructivist Web-based program to support site supervisors in their assessments of student dietitians during clinical placements.

Methods: This project was undertaken as design-based research in two stages. Stage 1 describes the research consultation, development of the prototype, and formative feedback. In Stage 2, the program was pilot-tested and evaluated by a purposeful sample of nine clinical supervisors. Data generated as a result of user participation during the pilot test is reported. Users’ experiences with the program were also explored via interviews (six in a focus group and three individually). The interviews were transcribed verbatim and thematic analysis conducted from a pedagogical perspective using van Manen’s highlighting approach.

Results: This research succeeded in developing a Web-based program, “Feed our Future”, that increased supervisors’ confidence with their competency-based assessments of students on clinical placements. Three pedagogical themes emerged: constructivist design supports transformative Web-based learning; videos make abstract concepts tangible; and accessibility, usability, and pedagogy are interdependent.

Conclusions: Web-based programs, such as Feed our Future, offer a viable means for universities to support clinical supervisors in their assessment practices during clinical placements. A design-based research approach offers a practical process for such Web-based tool development, highlighting pedagogical barriers for planning purposes.

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KEYWORDS
competency-based education; preceptorship; e-learning; pedagogy; constructivist; dietitian
Introduction

Support for Supervisors to Assess Clinical Competence
Within the dietetics profession, students are required to complete 20 weeks of placement, with half of that time spent in developing and demonstrating competence in individual case management [1]. The assessment of the clinical competence of student dietitians is a shared responsibility between the university and the health sector [1], with the assessments made by site supervisors during clinical placements providing a key source of evidence of student competence [2]. The difficulties faced by site supervisors in assessing student performances during clinical placements are clearly reported in the literature [3,4]. Clinicians therefore need to be supported by universities to use credible and defensible assessment practices [5]; however, the geographical distribution of placement sites prohibits face-to-face education of all supervisors.

Web-Based Delivery
Web-based delivery of education to support clinical supervisors has been successfully used by the professions of medicine, nursing, and physiotherapy [6-9]. The Web-based mode transcends geographical and time constraints [10] and may be more accessible to clinicians, particularly those in rural or community-based settings who may be sole practitioners within a multidisciplinary team [11]. Web-based delivery provides an efficient means to share resources and avoid duplication [12]. Professional development delivered via the Web has been shown to achieve equivalent outcomes (satisfaction, knowledge retention, and change in practice) when compared to face-to-face delivery [13,14].

Pedagogy
When developing a Web-based learning program, both the discipline-specific content and the learning process need to be considered. Constructivist pedagogy, in which learners construct their own meaning by forming connections through collaboration and reflection between their prior knowledge and new experiences (authentic real-world problems), has been recommended for Web-based delivery [15,16]. Collaboration can be supported within a virtual community using a central online discussion forum [17]. This learner-centered approach to Web-based education allows participants to be independent self-paced learners and to select learning content in a way that meets their learning style [16,17]. Rowe and Rafferty [18] have demonstrated improved user engagement with Web-based learning by self-regulated learning strategies such as activation of prior knowledge, self-monitoring, and reflections. There is evidence to suggest video-based learning material may improve learner engagement [9,19-21]. Effective Web-based delivery must also consider the usability and accessibility of the program [22,23].

Objective
Programs to educate supervisors in the use of more credible and defensible assessment practices are currently non-existent. This paper explores the potential for a Web- and video-based constructivist tool to support clinical supervisors to use credible and defensible assessment practices during clinical placements. The program aims to use authentic video-based learning material and metacognitive activities such as self-monitoring and reflection to support clinical supervisors to transform their assessment practices. The study also considers the interdependence between pedagogy, usability, and accessibility.

Methods
Design-Based Research
The Web-based program “Feed our Future” was developed using a design-based research approach adapted from Wang and Hannifin [24]. This approach has been used in the design of technology-enhanced learning environments for the way in which it advances design, research, and practice concurrently [25]. Design-based research addresses a practical problem in context, is informed by theory, and is refined through an iterative process of formative feedback and reflection in consultation with participants [25]. In the final stage of product development in design-based research, the intervention is pilot-tested and evaluated. This stage is then used to inform final revisions of the program [24].

Stage 1: Program Development
In October 2012, research consultation and initial development of the program commenced concurrently.

Research Consultation
Research presented in the publication, “Credible and defensible assessment of entry-level clinical competence: Insights from a modified Delphi study” [26], informed the development of the professional content of the program. This research was conducted with a panel of experienced clinical supervisors (potential end-users) and explored the issues of judgment and subjectivity in the assessment of health professional competence. The paper includes a focused literature review on credible and defensible competency-based assessment practices including the need for a shared definition of competence [27], clearly defined standards [28], a global approach to assessment [29], consideration of the learning context [30,31], multiple sources of evidence [32], and the need for an interpretive community of assessors [33].

Development of the Prototype
An interview with Professor Sue Ash, a member of the original taskforce that developed the dietetic competency standards in 1994 [34], and participated in their reviews [35,36], was recorded as expert opinion. This recording was incorporated into the program to provide clarity on the definition and application of the competency standards within the dietetics profession. Evidence suggests that resources to support assessments such as visual representation of entry-level performance may increase the consistency of supervisor assessments [37]. As an outcome from the research consultation, 11 video recordings of authentic dietetic student-client consultations were produced for the program (mean duration 60 minutes; residential aged care and outpatient settings), with corresponding assessments of each student’s performance made by the panel of experienced clinical supervisors [26].
Information technology (IT) expertise from an academic was sought to select an appropriate delivery platform. Consideration was given to budget and timeline, security, usability, incorporation of different file types, with particular considerations of video recordings, and capacity to provide feedback to participants on their learning.

The first prototype of Feed our Future was completed within 8 months using the website builder WIX as the delivery platform. The planned learning outcomes for the program were for supervisors (1) to feel more confident in their approach to assessment, and (2) to use credible and defensible competency-based assessment practices. The program comprised four learning modules, each including questions to consider, problem-based learning and self-monitoring activities, key concepts, and suggested readings. A pre-program quiz, a post-program quiz, a discussion forum, and a practice capstone module were included.

**Formative Feedback**

Feedback obtained during the Feed our Future program development included several sources. An advisory group comprised of industry, academic, student, consumer, and regulatory representation provided direction on the research and the development of the Web-based program. Potential end users trialed the prototype and provided feedback via a market stallbooth established at the Annual National Conference of the Dietitians Association of Australia (DAA) in May 2013. The DAA’s Board of Directors also reviewed the program.

**Stage 2: Pilot Test and Evaluation**

**Participants**

A purposeful sample of nine dietitians located in a variety of health care sites and involved in the University of Canberra’s clinical placement program was invited, via email, to participate in this study. These potential end-users were provided with access to the password-protected website and asked to pilot-test the program over a 4-week period. The Human Research Ethics Committee (HREC) of the University of Canberra approved the study protocol (12-209) that conformed to the provisions of the Declaration of Helsinki.

**Data Generated From Feed Our Future**

Data generated as a result of user participation during the pilot test including participation rates and outcomes from the pre-test, discussion forum, multiple choice quiz, and the post-test, were reviewed. In the pre-test and post-test, participants were asked to (1) rate their level of confidence with assessing a student’s competence during his/her clinical placement using a 10-point scale (1=not at all confident; 10=extremely confident), (2) rate a student’s performance as observed from a video recording (the method of assessment is described elsewhere [26]), and (3) provide a qualitative description of how they would ensure their assessment of a student’s competence during his/her clinical placement was credible and defensible. Content analysis was used to analyze the qualitative responses from the discussion forum, informed by the focused literature on credible and defensible assessment practices described in the research consultation section [26].

**Qualitative Evaluation**

User experiences during the pilot test were explored using an interpretivist qualitative approach. During the pilot test, users were invited to reflect on a series of questions to be discussed at a later interview. Interviews were held in a focus group for those who could attend (n=6) and in the format of individual interviews, via telephone, for the remainder (n=3). Focus groups were chosen to make use of group dynamics to stimulate discussion in a secure environment [38]. The focus group and individual interviews were facilitated by the primary researcher and began with a scripted introduction outlining the research and ethical considerations. Users provided informed signed written consent that included permission for their interview to be audio-recorded. In the focus group session, a research assistant was employed as a scribe.

The interview questions were developed by the first author in consultation with LW and MJ and covered (1) the overall experience of using the Feed Our Future program, (2) what they learned, (3) whether and in what way their thinking had been challenged, (4) whether it had prompted them to change the way they assessed students on their clinical placement, and (5) suggestions to improve the program. Users were also asked to describe their workplace and experience with supervising and assessing students up to the time of viewing the program. Recordings were audiorecorded, transcribed verbatim by two researchers, and crosschecked for accuracy to maintain the integrity of user responses. Transcripts were analyzed independently by the primary researcher and one research assistant with themes highlighted using van Manen’s highlighting approach to thematic analysis [39]. Pedagogical themes arising from the focus group and individual interviews were compared and found to be similar enough to pool. Exemplar quotations illustrating each theme were identified.

**Results**

**Stage 1: Program Development**

**Formative Feedback**

Table 1 presents the formative feedback that was generated from the advisory committee, dietitians at the Dietitians Association of Australia’s (DAA) National Conference, and from the DAA Board of Directors.
Table 1. Formative feedback and subsequent refinement to the program.

<table>
<thead>
<tr>
<th>Source</th>
<th>Feedback</th>
<th>Refinement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advisory Committee</strong></td>
<td>Learner-centered approach</td>
<td>No change recommended</td>
</tr>
<tr>
<td></td>
<td>Professional content</td>
<td>Emphasized that competence cannot be assessed from a single performance.</td>
</tr>
<tr>
<td></td>
<td>Use of authentic videos</td>
<td>Keep videos footage in context</td>
</tr>
<tr>
<td></td>
<td>An interpretative community of assessors</td>
<td>Include a feedback session with insights from students^a</td>
</tr>
<tr>
<td><strong>End users at DAA conference stall</strong></td>
<td>Need for aesthetic improvements^a</td>
<td>Reduced the amount of text per page</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Removed images that did not add meaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase consistency across modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Added audio file introduction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provided a program overview</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Included direction arrows on each page</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Added a file path to each page</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Made all modules accessible from the homepage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YouTube videos also made accessible through Dropbox as .mp4 file type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Added contact details for IT support on homepage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>External discussion forum added</td>
</tr>
<tr>
<td><strong>Dietitians Association of Australia (DAA) Board</strong></td>
<td>Program endorsement under consideration</td>
<td>Review by the Australian Dietetics Council pending^a</td>
</tr>
<tr>
<td></td>
<td>Approved for dissemination through the Dietetics Information and Nutrition Education Resource Database (DINER) accessible to all DAA members</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agreed to promote program through professional online newsletter to DAA members</td>
<td></td>
</tr>
</tbody>
</table>

^aThese items need addressing; all other items were supported/addressed.

Stage 2: Pilot Test and Evaluation

Participants

Of the nine users that pilot-tested Feed our Future, two were from rural and seven from urban locations, four worked in hospitals and five in community settings; five were experienced supervisors, two reported some experience, and two had little or no experience with supervising students.

Data Generated From Feed Our Future

Data generated by participants after pilot-testing the program Feed our Future are presented in Tables 2-4. In the pre-test, the mean confidence level for users with their assessment approach (using a 10-point scale: 1=not at all confident; 10=extremely confident) was 5.75 (range 2-9). In the pre-test, only five out of eight users rated the student performance, as observed from the video recording, in a similar way to the panel of experienced supervisors (see Table 3). In their qualitative responses, only some concepts supporting credible and defensible competency-based assessment practices were identified by the users (see Table 4).

Although technical issues prevented some users from participating, the discussion forum was used for introductions and to share learning and reflections. The average score achieved from the multiple choice quiz by users was 86%. Technical issues delayed participants’ completion of the program and hence no results are available from the post-test.
Table 2. Data generated from Feed our Future: participation.

<table>
<thead>
<tr>
<th>Program feature</th>
<th>Number of users (n=9)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
</tr>
<tr>
<td>Pre-test</td>
<td>8 (89%)</td>
</tr>
<tr>
<td>Forum</td>
<td>4 (44%)</td>
</tr>
<tr>
<td>Multiple choice quiz</td>
<td>7 (78%)</td>
</tr>
<tr>
<td>Post-test</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Table 3. Data generated from Feed our Future: pre-test results Question 2: assessment rating of student’s performance by users.

<table>
<thead>
<tr>
<th>Rating scale used to assess student’s performance</th>
<th>Number of users who rated the performance at each stage (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
</tr>
<tr>
<td>Novice</td>
<td>1 (13%)</td>
</tr>
<tr>
<td>Intermediate/beginner\a</td>
<td>5 (63%)</td>
</tr>
<tr>
<td>Entry-level competent</td>
<td>2 (25%)</td>
</tr>
</tbody>
</table>

\a Consistent with the panel rating.

Table 4. Data generated from Feed our Future: pre-test results Question 3: content analysis from qualitative responses informed by focus literature review [26].

<table>
<thead>
<tr>
<th>Competency-based assessment practice considered by users</th>
<th>Number of users (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
</tr>
<tr>
<td>Defined standards</td>
<td>7 (88%)</td>
</tr>
<tr>
<td>Global approach</td>
<td>2 (25%)</td>
</tr>
<tr>
<td>Supervisor collaboration</td>
<td>3 (37%)</td>
</tr>
<tr>
<td>Evidence-based</td>
<td>6 (75%)</td>
</tr>
</tbody>
</table>

Qualitative Evaluation

The analysis of interview transcripts revealed three pedagogical themes: (1) constructivist design supports transformative online learning, (2) videos make abstract concepts tangible, and (3) accessibility, usability, and pedagogy are interdependent.

Theme 1: Constructivist Design Supports Transformative Online Learning

Although the post-test was not completed by users due to technical issues, qualitative feedback from the focus group and personal interviews showed an increase in user confidence as demonstrated by this exemplar quote:

From doing this, I now feel like I would be able to confidently have a final clinical placement student. [Focus Group User # 3]

The constructivist design assisted users to apply their learning as demonstrated by the exemplar quotes in Table 5. The program enabled users to compare their assessments of an individual student performance with those made by a panel of experienced supervisors. As one user commented:

We can use this process for moderation, if we have a number of different supervisors that watch a particular video, we could use it to make sure that our assessments are similar… [Personal Interview User #9]

Through participation in the program, users achieved consensus in their understanding of entry-level performance.

Table 5. Constructivist design supports transformative online learning.

<table>
<thead>
<tr>
<th>Pedagogical feature</th>
<th>Exemplar quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner-centered approach</td>
<td>I found the program very accessible, I found it well structured, I found it sort of oriented towards self-learning, and that you could complete it in different parts. (Focus Group User #5)</td>
</tr>
<tr>
<td>Authentic problem-based learning activities</td>
<td>I sort of never really thought about how to apply the competencies, and the types of patients, the different wards that we have in the hospitals… doing that activity where it had each of the competencies broken down and how you’d apply them …I was like, ‘oh’ I can totally figure out how to do it…(Focus Group User #2)</td>
</tr>
<tr>
<td>Metacognitive activities</td>
<td>I suppose it just made me sort of reflect on my transition from being you know a student to a new grad and it made a bit more sense, being able to apply it [the competency standards] in different situations…(Focus Group User #3).</td>
</tr>
</tbody>
</table>
Theme 2: Videos Make Abstract Concepts Tangible

Users supported the use of video-based learning material:

you can read about it, but actually seeing the videos of an assessment, and knowing where they sit on the scale [from novice to expert]...you know we always want to see stuff in action. [Focus Group User #3]

They commented that prior to completing the program they had found the learning content “difficult to apply” and “frustrating at times”. The users found that the video representations of the authentic student-patient consultations allowed their understanding of “entry-level” competence to become more tangible.

I really liked the videos that when, at the end of them would show the scale of where the students were, like from the beginning to the end. [Focus Group Participant #2]

As demonstrated by Figure 1, organizing the videos on a scale helped the supervisors to distinguish between a novice, intermediate, and entry-level student performances.

Figure 1. Visual representation of competency development using videos.

Theme 3: Accessibility, Usability, and Pedagogy Are Interdependent

IT access and capacity at some worksites limited engagement with the program:

I’m computer literate but not really up-to-speed with some technological advances I suppose. I was a bit frustrated with some of those things...I suppose once

I get annoyed with something I’m not inclined to go back. [Personal Interview User #7]

Table 6 summarizes accessibility and usability barriers experienced by users and presents revisions made to improve the program.

Product Release and Dissemination

Table 7 presents the final learning content for Feed our Future. Figures 2-4 present screenshots of the final interface.
Table 6. Program features: barriers and solutions.

<table>
<thead>
<tr>
<th>Program feature</th>
<th>Barriers</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Usability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shared computer workstations</td>
<td>Changed to university-hosted delivery platform that supported individual log-ins and was compatible with Internet Explorer.</td>
</tr>
<tr>
<td></td>
<td>Internet browsers available at some worksites not compatible with delivery platform</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clearer expectations required for learning modules including time commitments</td>
<td>An introductory video and program outline (including endorsement, program description, learning outcomes, learning content, background, acknowledgements, evaluation processes, and certificate of completion) were added to the program.</td>
</tr>
<tr>
<td><strong>Authentic video-based learning material</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Length of patient/student encounters reduced engagement</td>
<td>Videos edited and shortened; average 8.5 min. (range 0.58-18.17)</td>
</tr>
<tr>
<td></td>
<td>Network capacity issues</td>
<td></td>
</tr>
<tr>
<td><strong>Virtual online community</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security restrictions prevented participation at some sites</td>
<td>Changed to university-hosted delivery platform with embedded discussion forum</td>
</tr>
</tbody>
</table>

Table 7. Learning content included in Feed our Future.

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>Learning objective</th>
<th>Learning experiences</th>
<th>Self-monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Before you begin</td>
<td>About this program</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engage your prior knowledge / Pre-test evaluation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Introducing the learning modules</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>To understand how the competency standards are defined, developed, and used by the dietetics profession</td>
<td>Reading: Competency-based assessment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Video: Development of competency standards with Sue Ash</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>To explain the relationship between context and competence</td>
<td>Reading: Competence and context</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Video: A case example of a non-traditional setting</td>
<td>Reflection</td>
</tr>
<tr>
<td>60</td>
<td>To apply unit 4 of the competency standards (DAA, 2009) in your clinical setting</td>
<td>Reading: Applying the competency standards-1 Problem-based learning activity: Entry-level competence in your clinical setting</td>
<td>Reflection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reading: Applying the competency standards-2</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>To evaluate student performances from authentic student-client consultations using a credible and defendable approach to competency-based assessment</td>
<td>Reading: Applying the competency standards-3 Scaffolded case study: Assess a video of an authentic client consultation</td>
<td></td>
</tr>
<tr>
<td>60-180</td>
<td>To consolidate credible and defendable competency-based practices using authentic student-client consultations</td>
<td>Case studies: Assess videos of authentic client consultations</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>What you have learned</td>
<td>Post-test evaluation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Certificate of completion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>References</td>
<td></td>
</tr>
</tbody>
</table>
Figure 2. Final interface home page.

Feed Our Future

eLearning for Clinical Dietitians
Please click the arrow below to listen to the introduction

Announcements
An Interpretive Community

Please use this forum to discuss your learning, assessments and comments about the program. Through collaboration we can justify our thinking, learn from the ideas of others and re-assess our judgments.

All journal articles included in the Suggested Readings can be accessed here.

e-reserve

Before You Begin
Module 1
Module 2

Module 3
Module 4
Practice Capstone Module

What you have learnt
Figure 3. Final interface learning modules.

Learning Objective:
To describe how the competency standards are defined, developed and used by the dietetics profession.

Questions to Consider:
1. How would you describe competence?
2. How are the competency standards used in the dietetics profession?
3. Why is the approach used to develop the competency standards relevant when considering the assessment of student competence during individual Case Management (ICM) clinical placements?

Learning Activities:
Step 1 - Read the on-line book below about the definition, development and use of competency-based assessment in the dietetics profession.

Competency-Based Assessment

Step 2 - Watch this video. It is the first of a series of interviews with Professor Sue Ash who was a member of the task force that developed the Dietitians Association of Australia (DAA) National Competency Standards and who was involved in their later reviews in 1998 and 2006.

Assess Your Understanding:
Complete this three question multiple choice quiz to check your understanding of the key concepts included in this module.

Feedback Quiz

KEY Concepts:
- Competence is required to function successfully in the workplace.
- Competence is part of a continuum of life-long learning from novice to expert.
- The competency standards (DAA, 2009) provide the criteria to assess if a student is ready to enter the profession.
- The competency standards (DAA, 2009) describe the job roles of dietitians in Australia.
- The competency standards (DAA, 2009) are intended to be used together as an integrated whole.

Suggested Reading:
**Discussion**

**Principal Results**

This paper describes the development of the first research- and Web-based learning program to support clinical supervisors in their assessments of student dietician competence during clinical placements. This case example demonstrates the value of a design-based research and consultative approach to developing a program. The use of a Web-based mode has the potential to disseminate expertise and research findings nationally, overcoming geographical and time boundaries, in the provision of continuing professional development to health practitioners who assess student performance.

**Comparisons With Prior Work**

The results of the pilot test supported the pedagogical design of Feed our Future. The program encouraged independent self-paced learning and catered to different learning styles as recommended by Ng’ambi and Lombe [16]. Participants demonstrated new understandings that aligned with the programs’ learning objectives of the program through the use of authentic student-client consultations, problem-based learning activities, and reflections. Kyeong-Ju Seo and Engelhard [9]
achieved similar results with their constructivist Web-based continuing education program for physiotherapy supervisors with their participants perceiving improvements in the quality of their clinical education skills and practices. The approach used in this study highlights the interdependence of pedagogical, usability, and accessibility considerations [22] with the iterative process and the end-user involvement facilitating the identification of barriers to effective educational outcomes.

Participants in the pilot test found the video recordings of student-client consultations to be helpful in learning about competency-assessment practices. Clinical vignettes in traditional face-to-face learning programs have been used to assist supervisors to gain a shared understanding of entry-level competence in physiotherapy [37]. When used in Web-based delivery, videos have been shown to help engage students and improve learning outcomes [20,21,40]. Maloney and colleagues [19] found learners preferred videos in comparison to other learning materials made available through a Web-based resource repository. Developing a Web-based program with a large number of videos (n=20) in Feed our Future was technically challenging. The decision to edit and divide the videos was driven by network capacity limitations, but Guo’s research [41] suggests that short (6-9 minute) videos also have pedagogical advantages.

Consistent with the findings of Cook and Steinert [14], users appreciated material that was relevant, well-organized, and had clear expectations including time commitments. The participation rates for the discussion forum in this study were low despite the fact that other studies have identified conversational discussion and social bonding as key factors for successful Web-based education [14]. This feature is also key to constructivist pedagogy [16] and aligns with the notion of an interpretive community of assessors [33]. Possible solutions to address the lack of engagement with discussions may include more active moderation on the forum, blended Web-based learning with face-to-face contact, a social media approach that conforms to workplace security restrictions, or more assistance with technical problems [14].

Technical barriers experienced in the pilot-testing of Feed our Future such as IT incompatibilities between organizations’ infrastructure, software and Internet browsers, security restrictions, and bandwidth limitations are not unique [42]. Universities have very few security restrictions and are able to use programs such as YouTube to achieve positive learning outcomes [43]. Awareness that this freedom may not be available in some health settings is required if effective Web-based programs are to be available for use by clinical supervisors working in these settings.

Feed our Future, like many programs [44,45], was developed on a limited budget. Lack of IT expertise, infrastructure, and associated software, were limitations to the development of this program. Two years was required to complete the design-based research approach. Despite the advantages, the development requirements for Web-based programs are more labor intensive than face-to-face delivery [44,45].

Limitations
The research-based design and national consultation used for the development of this program was robust. The sample size and the qualitative design of the pilot test and evaluation, although consistent with similar studies [46,47], does not support generalization of the results. Rather, these findings have been used to inform and improve the innovative product. Due to the lack of comparison with other modes of delivery, conclusions cannot be drawn as to whether Web-based delivery was the preferred option by clinical supervisors. The design-based research approach, however, offers supporting evidence for Web-based pedagogical approaches [25]. Further research is required to measure whether the learning of participants translated into actual changes in their competency-based assessment practices, and to determine the uptake of the program nationally.

Conclusion
Web-based programs, such as Feed our Future, offer a viable solution for universities to provide professional development to geographically dispersed clinical supervisors in preparation for their students’ clinical placements. A design-based research approach offers a practical process for Web-based tool development.

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Conflicts of Interest
None declared.

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Abbreviations

DAA: Dietitians Association of Australia
IT: information technology
7.3 Contribution of this Manuscript

This manuscript contributes to the thesis by providing an example of how web-based education can support clinical supervisors to develop a more credible and defensible approach to the assessments of student dietitians during ICM placements. Not only did completing the program increase clinical supervisor confidence with their assessments, the constructivist design challenged supervisors to apply their new understandings and reflect on their current practices.

The supervisors found the authentic video recordings of dietetic consultations particularly helpful in gaining an understanding of the development of ICM competence. This material together with the written assessments from the panel of experienced supervisors, helped the participants to share a common understanding of entry-level practice and to understand what constituted a borderline performance. More thought is still required on the role of the student in the assessment process and the use of assessments to inform student learning.

There is a risk with using concrete examples of student performance in their becoming too prescriptive. With adequate funding the dynamic nature of clinical placements might be realised. There is potential to introduce new material including reflective interviews with students. Through the ‘interpretive community’ supervisors can justify their assessments, identify their assumptions and reconsider their judgements.
This thesis has supported a mixed method approach to research in order to provide a more holistic understanding of the use of non-hospital settings for the development and demonstration of ICM competence for student dietitians. It also supports the use of a mixed method approach to assessment, in order to provide a more comprehensive understanding of a student learning development and to support their personal development as future dietitians.

Web-based programs, such as *Feed Our Future*, offer a potential solution for Universities to support clinical supervisors with their assessment responsibilities during placements. Web-based learning is ideally suited to support supervisors, as it overcomes geographical and time boundaries. This same advantage is available to support students’ during ICM placements, such as assisting them with the transition across different settings.

The design-based research approach used in this paper offers a practical process for web-based tool development. The paper has highlighted the interdependence of pedagogical, usability and accessibility considerations. Incompatibilities between organisations’ infrastructure, software and internet browsers, security restrictions and bandwidth limitations are significant challenges that must be resolved to achieve successful delivery of web-based programs.
Chapter 8: Discussion

8.1 Introduction

Each manuscript presented in this thesis (Chapters 4 to 7) has a separate discussion that provides a commentary on the findings in relation to the literature, considers the strengths and limitations of the study, and the implications of the results. This chapter provides synthesis of how the findings presented in the four publications address the research questions and add to the developing literature on competency-based assessment, clinical education and workforce development within the dietetic profession.

8.2 The Current Healthcare Context

Over the period in which this research has been conducted, there has been a change in the party in the Federal Government in Australia to a more conservative Liberal party. The new government restructured Health Workforce Australia into the Department of Health. Despite this change, the need to address the burden of chronic disease in the context of an ageing population remains (AIHW 2014). The restructuring of Medicare Locals (refer to Chapter 5, Manuscript 2; operational definition provided in Appendix 1) to Primary Health Care Networks continues the recognition of the need for consumer led multidisciplinary services but gives greater prominence to general practitioners, at the expense of allied health, for the coordination of community based healthcare (DoH 2014). The focus of the current Government on community-based individualised clinical care and their goal to improve the coordination and continuity of care (DoH 2014) aligns with the research outcomes presented in this thesis.
8.3 Research Outcomes

The research presented in Chapters 4 to 7 supports the thesis that clinical placements outside the hospital can contribute to the delivery of healthcare in underserviced settings, prepare graduates for the future workforce, and provide valuable experiences for student dietitians to develop competence in the ICM domain. This thesis considers the implications of nuanced practice differences between clinical settings for student dietitians and their supervisors during ICM placements.

As a consequence of this research, questions are raised in regard to the current competency-based assessment practices within the dietetic profession. This thesis is not concerned with the development of a competency-based assessment tool but rather, considers the approach used by clinical supervisors for assessments during ICM placements. It explores the potential benefits of web-based programs to support clinical supervisors to gain a shared understanding of ICM competency development and to facilitate ‘consensus’ in assessments during clinical placements.

8.3.1 Research Aims

1. The first aim of this thesis was to evaluate the experiences of key stakeholders who were involved with health services providing ICM clinical placements for student dietitians outside the hospital setting. The context-specific case study (Chapter 4) demonstrated the potential to provide high quality healthcare in underserviced areas using a paid preceptor model. These findings, although not
generalisable, are consistent with other research (Burrows et al. 2013; Clinical Education & Training Queensland 2011; Grealish et al. 2013; Meek et al. 2013). The observations by the panel of experienced supervisors of student performances in underserviced areas (Chapters 5 and 6) suggests that students who complete placements in community settings deliver services that align with current healthcare demands. Dietetic students who had completed half their ICM placements in a hospital and the other half in the SAS felt that the community and aged care settings provided them with an equivalent placement experience to the hospital (Chapter 4).

2. The second aim of this thesis was to identify to what extent Australian tertiary dietetic programs are using settings outside the hospital for ICM clinical placements. The national survey with placement coordinators showed that most universities rely almost exclusively on hospitals for ICM placements (Chapter 5). The preliminary findings of this research suggest that: (1) students who complete placement in a range of settings may be better equipped to meet the demands of the future workforce; and (2) innovative pedagogical approaches may better prepare graduates for emerging areas of practice. Study 4 showed that site supervisors take primary responsibility for assessing student competence to enter the profession despite using untested assessment instruments based on traditional practices. This information informed the research methods used to address the third aim of the thesis.
3. The third aim of this thesis was to explore the development of ICM clinical competencies in students placed outside the hospital setting. Results from Study 5 provided expert opinion supporting the view that students are able to develop and demonstrate ICM competencies in outpatient and residential aged care facilities. Feedback from supervisors in Study 5 and Study 6 demonstrate the influence of context on competency development and the need for adjustments to be made for the nuanced practice differences during placements in community settings.

Although the supervisors shared a conceptual understanding of competence, this did not translate into consistent judgments in regard to the student performances (Chapter 6) highlighting the subjectivity of workplace assessments. This is consistent with data from Study 3 and Study 6 and evidence from other research within the dietetic profession (Lennie & Juwah 2010; Palermo et al. 2014a; Palermo et al. 2014b). However, as a community the supervisors were able to reach consensus in their judgments on all but one performance (Chapter 6). This finding supports the need to reframe workplace assessments as ‘interpretations’ rather than absolute truth. This research supports the use of panels, rather than individual judgments to determine a student’s ‘fitness to practise’.

4. The final aim of this research was to use the findings from Phases 1 to 3 to develop a web-based program to support clinical supervisors in their assessments of student performances. Results from Study 6 suggest that the program developed, Feed Our Future, supported clinical supervisors to develop a more credible and defensible approach to competency-based assessment during ICM
clinical placements. The incorporation of video-based learning materials allowed the understanding of competence to become more tangible for supervisors. Since performance is context dependent, these recordings (videos of student-client consultations with corresponding assessments by the panel of experienced supervisors) should not be used prescriptively. Rather, they can provide a catalyst to stimulate a professional discourse on the assessment and development of competence. Chapter 7 describes how a design-based research and consultative process, considering content, pedagogy, accessibility and usability, can be used to develop web-delivered programs.

8.4 The alignment of clinical education with future workforce demands

This research shows that key stakeholders, including students, consumers, the DAA and experienced supervisors, support the use of community settings for ICM placements. Not only do these settings provide student experiences that enable the development of ICM competence, they may in fact be better aligned to support the development of attributes that are highly valued in the future workforce.

8.4.1 Developing ICM competence in placements outside the hospital setting

As discussed in Chapter 5 a practice hierarchy has been identified in the health professions where the perception exists that the ‘gold standard’ for clinical placements is in the hospital setting (Bjork et al. 2014; Lordly & Taper 2008). This was evident in the results from Study 4. This nationally representative survey showed that most Australian
universities use hospitals for the majority of their ICM placements. Some placement coordinators thought that students preferred to complete ICM placements in a hospital. Students who participated in Study 3 however, were equally satisfied with the quality of their ICM clinical experiences in the outpatient and aged care settings as with the traditional hospital setting. Research from medicine and nursing also suggests that student satisfaction is similar when clinical placement experiences are in the community or hospital settings (Bjork et al. 2014; Gat & Ratzon 2014; Murphy et al. 2012).

Study 4 showed that some university academics felt it was the preference of the DAA for ICM placements to be completed in a hospital. Yet the DAA Accreditation Manual (DAA 2011) states that students are able to complete up to 60 per cent of ICM clinical placements in settings outside the hospital provided they can demonstrate depth and breadth of case-mix experience.

In selecting these [ICM] placements, universities need to ensure that students will have the opportunity to be exposed to a variety of cases to enable consistent and safe practice in both an acute and ambulatory setting (DAA 2011, p.13).

The DAA Range of Variables Statements (DAA 2009) also lists ambulatory care as an appropriate context for ICM placements.

The value of outpatient settings has been recognised by some Universities. For example, The University of Newcastle has established weight loss outpatient clinics to assist students to develop clinical skills (Burrows et al. 2013) as part of their coursework units.
Research findings from Study 4 showed that some universities use outpatient clinics as an ICM placement setting. In most instances however, this setting is only available to a small number of students or for short durations with ICM placements occurring in urban hospital outpatient clinics.

The DAA competency standards (DAA 2009) define the job roles of dietitians (Ash & Phillips 2000) and therefore it is expected that ICM placement settings reflect the positions where dietitians provide clinical care. In the reviews of the DAA competency standards every effort was made to ensure that the standards aligned with current dietetic practice and new elements were added to reflect emerging areas such as private practice (Dowding et al. 2011; Phillips et al. 2000a). Yet the practice of using hospitals as the clinical placement settings where students are required to demonstrate these competencies has remained unchanged.

The modified-Delphi study (Chapter 5) provides evidence, in the form of expert opinion, in support of the view that students are able to demonstrate ICM competencies in placements outside the hospital setting. After assessing the authentic recordings of consultations of students / dietitians consultations with during clients, the panel of experienced supervisors agreed that both outpatient and aged care settings provided an appropriate context for students to develop and demonstrate competence in the ICM domain. These results are consistent with the findings from other health disciplines. A recent study of speech pathology students compared both hospital and community
settings (Sheepway et al. 2014) and showed that students were able to transform their learning from one setting to another. The placement settings did not have a significant overall effect on student development of clinical competence. Competency development was cumulative. Within medicine, community placement experiences have resulted in comparable student performances to the hospital setting (Owen et al. 2013; Worley et al. 2006).

Palermo and colleagues (2015b) have suggested that not all placement settings provide learning experiences that align with the learning needs of student dietitians. According to the theory of ‘Community of Practice’ (Wenger 1998) a student’s learning is enhanced through a sense of belonging and participation within the healthcare team. In recent years, supervisors have raised concerns that student dietitians have had less opportunity to participate in patient care within acute public hospitals due to the complex nature of the patients (Palermo et al. 2014a). This is consistent with findings in nursing. Murphy and colleagues (2012) found students preferred community placements rather than specialist areas of practice in hospitals that provided fewer opportunities for students to be actively involved in care provision.

With reduced length of patient stays in hospitals the opportunity for monitoring and evaluation of patients is also reduced (White & Beto 2013). In Study 6, the clinical supervisors who participated in the evaluation of the web-based tool supported the use of
aged care settings for ICM placements to develop competencies in monitoring and evaluation (Unit 4.7) as demonstrated by the following quote:

It made me think about what we do…about how student placements in aged-care facilities could be useful, and I thought of course, yes they are useful …I could see that they could be reviewing a patient over a period of time and finding the way that they had changed their habits (Personal Interview Participant #7).

The development of competence is dependent on the work context (Johnsson & Hager 2008). Different settings favour the development of different competencies. The findings from Study 5 found there were nuanced practice differences between the different ICM settings (see Table 4.3; published in Manuscript 2). When evaluating the web-based tool Feed Our Future (Chapter 6) the clinical supervisors discussed how the learning experiences of students was influenced by the placement setting:

If you’re in a nursing home… you’ve got to direct knowledge and your assessments to that type of audience… they might have a short attention span or hearing difficulties or cognitive issues so you’ve got to sort of adapt a little bit…(Focus Group Participant #3).

In the aged care setting subtle differences in competency development were evident when compared to the hospital setting with an emphasis on holistic assessments. This finding is also evident in with work of Lordly and Taper (2008) who demonstrated the contrast in language between aged care settings (quality of life, maintenance, comfort, total picture,
at home, liberal) with that of the acute care setting (proactive, urgent, aggressive, treatment, restricting). In the aged care setting, the need to use an individualised approach to consider the need for less restrictive diets (ADA 2010) influences interpretation of the competency standards by supervisors. The following quote is from an experienced supervisor after observing a nutrition consultation by a student with an aged care resident (Study 5):

We have been through this phase in dietetics where evidence based medicine has really been what’s on paper, what’s the review paper telling us – what’s all the evidence and forgetting that one of the other components of evidenced based medicine is patient preferences and what they want and I think this girl demonstrated a nice balanced response with evidence based medicine there (Focus Group Participant #2).

It is interesting to contrast this with a quote from Lordly and Taper (2008) from the acute care context:

The danger in the acute care setting with no long term care is that the dietitian can reduce the person to a set of lab values or a set of measurements or to a treatment – the humanity is lost (p.34).

Community-based settings have been shown to support development of client centred care by students (Merritt & Boogaerts 2014).

When the panel of experienced supervisors observed the performances of students in an aged care residence (Study 5) they agreed that placements in this setting favoured
development of the element of competency 4.1 (Undertakes screening and assessment to identify and prioritise those at nutritional risk). In the context of an ageing population, the number of people living in residential aged care is rising (AIHW 2012). Given malnutrition prevalence rates of 50 per cent in this setting (Banks 2007; Gaskill et al. 2008) the need for dietetic services provision in aged care is evident (DAA 2013).

Although most aged care facilities can access consultant dietitians, there may be a lack of awareness by management and care staff of their need for such services (DAA 2013; Thomas et al. 2006). Management do not have the in-depth food nutrition knowledge to identify gaps in food service and nutrition screening processes in aged care facilities (DAA 2012). Study 2 provided an example of how the SAS service was able to raise awareness of malnutrition concerns in aged care residents and the value of using dietitians to address this healthcare need:

The SAS made us realise there is a place for dietitians in aged care. They play a really important role in maintaining people’s weight and nutrition (Residential Aged Care Facility #2 Staff Focus Group Participant #1).

Similarly, findings presented in Study 2 showed that placements in the outpatient setting favoured the development of client-centred counselling skills, as is illustrated by these quotes from experienced supervisors who observed the authentic student/dietitian consultations conducted in an outpatient setting:
She did a few things really nicely, listening, active listening and the clarity of her goal settings was really evident (Focus Group Participant #7).

The other thing that was really good was how she was able to change track, so when the whole thing about the moods came up she went and got the mood diary…that was listening to the patient and responding (Focus Group Participant #4).

Reports from students completing placements in the SAS (Chapter 3) also supported this finding that outpatient settings enable good skill development in counselling:

This placement really helped me to build my counselling skills. This is something you do not get much of an opportunity to do if both clinical placements are undertaken in an acute hospital setting (Web-based survey qualitative response SAS Participant #4).

To meet the health care needs of an ageing population and with high prevalence of chronic disease, health services need to be delivered differently. Behaviour change counselling strategies (such as motivational interviewing, problem solving, goal-setting and self-monitoring), applied in changing at-risk behaviours, can markedly lower the incidence of chronic disease and disability (Chur-Hansen 2012; Rhen & Bettles 2012; Williams et al. 2014). Student dietitians can develop skills in these techniques through clinical experience (Schwartz et al. 2015), however, it is questionable whether ICM placements in hospitals can support this learning. The following quote from a recent Australian study presents the perspective of new graduates:
Hospital placements may not provide adequate opportunities for assessment of entry-level nutrition education and counselling skills due to the acute nature of the setting...community health, private practice or sub-acute settings could be more appropriate for assessment of skills such as those for managing chronic disease and long-term behaviour change (Palermo et al. 2015b, p.5).

Similar risks associated with ICM placements in the acute sector have been presented internationally as highlighted by this quote from a Canadian supervisor:

I was teaching patients just before they were going to surgery. The last thing on their mind would be diet...so educationally a teaching strategy in an acute care hospital setting was fairly inappropriate (Lordly & Taper 2008, p.54).

Other research supports the view that clinical placements in community health settings may better align graduates with the needs of the future workforce. Nursing students who had completed placements in community settings demonstrated a more client-centred approach to care, more appropriate referrals and better discharge planning when compared with nursing students who completed their placements in a hospital setting (Merritt & Boogaerts 2014). Medical students demonstrated better rapport building skills and a more holistic approach to healthcare (Crampton et al. 2013). Nursing students who completed placements in aged care settings demonstrated a greater understanding of ageing and aged care when compared to students who had completed placements in a hospital setting (Grealish et al. 2013). Graduates are more likely to work in an underserviced area if they have completed a placement in that setting (Jones et al. 2014; Kondalsamy-Chennakesavan et al. 2015; McCall et al. 2009; Brown et al. 2006).
Within a consumer-led integrated health care system, health professionals would no longer be required to work in only one setting (Bosanquet et al. 2006; Brownie et al. 2011). Research by Sheepway and colleagues (2014) suggests that the development of competence is cumulative across settings. The development of ICM competence in an outpatient clinic can be transformed and expanded to support competent performance in a hospital or aged care facility. For learning transformation to occur student dietitians need to recognise the nutrition care process at an abstract level that transcends the specifics of the ICM setting (Larsen & Feedman 2013). Offering iterations, through variation in case-mix and clinical setting, requires students to reflect on their experiences, recognise similarities and differences, seek new knowledge and create new understandings (Larsen & Feedman 2013). By including a range of placement settings in which to obtain this experience, students are required to actively transform their learning which supports their development as flexible practitioners.

**8.4.2 Innovative models of clinical education**

Clinical placements in community settings can assist workforce shortages by providing healthcare in areas with lower health staff to population ratios, making them relatively underserviced. The context-specific case study (Phase 1) demonstrated the potential for innovative placement models to provide dietetic services in the traditionally underserviced settings of aged care and community health. Study 1 demonstrated consumer satisfaction with the outpatient service provided by student dietitians. The themes that emerged from the focus groups and individual interviews in the aged care facilities in
Study 2 included improved staff knowledge, communication, and provision of individualised dietetic care. The results of Phase 1 of this research suggest that customer satisfaction is not compromised by student involvement (Burrows et al. 2013; Ellet et al. 2010; Hajioff & Birchall 1999; Meek et al. 2013; Simon et al. 2000).

In occupational therapy (Kersley 2012; Dancza et al. 2013; Gat and Ratzon 2014; Knightbridge 2014) and pharmacy (Kassam et al. 2013) role-emerging placements have led to job and service creation (Kearsley 2012). Placements in these disciplines are conducted with off-site supervision in settings where the role of the health professional has not yet been established. In placements with direct supervision students may replicate the specific knowledge and clinical skills of an established service, with limited critique in regard to theory (Kell 2014; Palermo et al. 2014a). In role-emerging placements students have to draw on theory, with offsite support, to guide their practice and establish the role for their profession (Dancza et al. 2013).

Health Workforce Australia, in consultation with DAA, has highlighted an oversupply of dietetic graduates, when consideration is given to the number of positions advertised for dietitians with limited experience (HWA 2014). In the current context the need for dietetics services is clearly evident (HWA 2014; NHMRC 2013; Nyland & Lafferty 2010), but in some settings, this need may not have been fully realised (DAA 2011) resulting in fewer positions for dietitians in those areas (Brown et al. 2012). It may be time for the dietetics profession to explore placement in role-emerging areas. This type of placement could align with the Australian Qualification Framework (2013) that
distinguishes between a Bachelor and Masters level of placement, where Masters Degree (coursework) students are required to demonstrate their application of knowledge and skills with ‘creativity’, ‘initiative’ and ‘a high level of personal autonomy and accountability’.

Models of clinical education where students are made responsible for care delivery, such as student-led services (Clinical Education and Training Queensland 2011; Grealish et al. 2013; Meek et al. 2013) and role emerging placements (Dancza et al. 2013; Gat & Ratzon 2014; Kassam et al. 2013), require students to participate autonomously, extend professional boundaries and engage in deep (as opposed to surface) learning (Dancz et al. 2013; Grealish et al. 2013). In addition to clinical skills, placements in these areas support students to develop generic attributes such as organisation, leadership and creativity (Gat & Ratzon 2014; Merritt & Boogaerts 2014); skills highly valued in the future workforce (Rhea & Bettles 2012). Such benefits were evident in the SAS case study in Study 1 as illustrated by the quote below (Chapter 3):

It was a good opportunity for me to improve my management and organisational skills as the clinic is totally handled by the students (Qualitative comment from the web-based survey).

8.4.3 Interdisciplinary care as part of student education

The SAS service provision was not without limitations. The finding from Study 2, that co-location of multi-disciplinary services did not constitute interdisciplinary care, is
disappointing but not surprising. The gap between interprofessional research and practice, including clinical education, is multifactorial. Barriers to interprofessional clinical education include the threat to professional identity, a lack of explicit policy frameworks, and discipline specific models of training, management and practice (Warner et al. 2008).

While best-practice care delivery requires an interprofessional approach (Zwarenstein et al. 2009), evidence suggests that models of care delivery and fee structures can foster community-based practitioners to deliver healthcare in discipline specific silos (ACICBL 2014). New community–based delivery models such as patient-centred medical homes (Brown-Riggs 2012) and reimbursement systems such as accountable care organisations (Howel & Leaphart 2014) offer promise for interprofessional practice for chronic disease management (American Advisory Committee on Interdisciplinary Community-Based Linkages (ACICBL 2014). Such models may achieve improved communication and data management systems through electronic technology. They have financial rewards for patient-centred coordination of care and place a focus on health outcomes rather than occasions of service.

Health professional competency standards have, in some instances, been a barrier rather than a driver in achieving interprofessional care (Barr et al. 2005; ACICBL 2009; Davidson et al. 2009; Warner, 2008). Although all disciplines would claim to value interprofessional clinical education (Scarvell & Stone 2010), the need for students to
demonstrate core professional competencies has, at times, led to the undervaluing of shared learning opportunities across disciplines (Newhouse & Spring 2010).

Competency standards are human constructs (Grealish 2009), established by professional associations to regulate professional membership and university program accreditation (AHPRA 2012). The Advisory Committee on Interdisciplinary Community-Based Linkages (2009) has identified a need for accrediting agencies to align accreditation requirements, review placement guidelines and competency standards, and discuss opportunities to facilitate interprofessional approaches to clinical education (ACICBL 2009).

The Australian Health Professions Accreditation Council’s Forum (HPACF) (2014) has recently completed a project that mapped accreditation standards across disciplines as part of the Health Practitioners Prescribing Project. The mapping identified interprofessional education as an area for possible future exploration (Vandouris 2013). The forum, while acknowledging the benefits of ‘multidisciplinary education outcomes’, appeared to see these as secondary to, and at times competing with, discipline-specific standards (HPACF 2014). The common health capabilities of HWA (2013) have the potential to better align competency development across the health disciplines. It is encouraging to see how the newly released version of the DAA competency standards (DAA 2015f; Appendix 2) incorporates these common capabilities (HWA 2013).
8.4.4 Conclusion

In Australia, ICM placements are predominantly provided in hospitals suggesting a misalignment between the theoretical perspective supported by the dietetic profession and the practices evident in dietetics placement programs. Expert opinion suggests that students can develop and demonstrate ICM competence in outpatient and aged care settings, and research suggests that students are equally satisfied with their learning experiences in these placements outside the traditional hospital setting. Rather than taking a hierarchical view, academic dietitians are encouraged to value the unique contributions made by practitioners in different clinical contexts.

The findings of this doctoral research suggest that innovative models of clinical education can: (1) raise awareness of the roles of dietitians outside traditional settings, contribute to service delivery and potentially lead to job creation in underserviced areas; and (2) support the development of attributes such as management and organisational skills and (3) encourage students to extend the professional boundaries of practice, such as adopting behaviour change techniques, rather than maintain current practices. Providing students with a range of ICM placement settings can: (1) support student participation and allow learning experiences to be individually targeted to their stage of learning; (2) support learning across the nutrition care process from screening to monitoring and evaluation; and (3) allow the development of competencies that are likely to be highly valued in the workforce of the future such as behavioural change techniques and workforce flexibility.
8.5 Shifting the focus of assessment

This research commenced with exploring the potential to develop and demonstrate ICM competence in placements outside the hospital setting. Through that process, this research has highlighted the subjectivity of assessment practices. Due to that subjectivity assessment should be reframed, moving away from the positivist notions of objectivity, reliability and validity, towards the more interpretivist notions of subjectivity, credibility and defensibility. This research has supported an approach to developing a shared understanding of entry-level competence that is sufficiently dynamic to accommodate a changing healthcare system.

8.5.1 Starting from a positivist paradigm

Traditionally, workplace assessments have been viewed from a positivist tradition where there is one true measurement of student competence that can be objectively determined using valid and reliable assessment tools (Wass et al. 2001). Most authors have agreed that assessment in the workplace is the ‘gold standard’ to determine ‘fitness for practice’ (Eraut 1994; Norcini 2010; McAllister et al. 2010; Wass et al. 2001). The results from Study 4 showed that in the absence of a validated assessment tool to measure ICM competence, the dietetics profession uses assessment tools based on traditional practices. A research instrument was therefore developed, using Unit 4 of the DAA Competency Standards for Entry-Level Dietitians (2009) together with Behavioural Descriptors and a visual analogue scale (2006) that had been previously validated for use in speech pathology. This tool was applied in Study 5 to provide a quantitative measure from which to compare the experienced supervisors assessments of video recordings of authentic
McAllister (2006) draws on the literature to apply learning theory to the development and assessment of competence. The Behavioural Descriptors integrate education theory, including the Model of Skills Acquisition (Benner 1984; Dreyfus and Dreyfus 1980), Scaffolding Theory (Anderson 1988; Brassuer 1989), Bloom’s Taxonomy (Anderson & Krathwohl 2001; Bloom 1994) and the SOLO Taxonomy (Biggs & Tang 2007) to describe how clinical workplace performance develops. The findings of this doctoral research reinforce this approach. In Study 5, all supervisors assessed the performances of the qualified dietitians as competent or above in the first round, providing a measure of validity to the assessment instrument. The supervisors also reported the Behavioural Descriptors to be a useful tool to help assess student performance level, particularly when applied to complex patient cases.

In Study 5, the supervisors demonstrated a common conceptual understanding of competence. They described competence using the performance criteria for Unit 4 (DAA 2009) and provided the following qualitative descriptions: ‘a demonstration of the dietetic process’; ‘understanding their scope of practice’; ‘the capacity for self-reflection'
and life-long learning’. This is consistent with the language used to describe competence in the academic literature within the dietetic profession (Ash & Phillips; Ash et al. 2011). As a panel, however, the supervisors struggled to identify the point at which the video recorded students reached a competent level of performance, as illustrated by the following quote:

I think what is tricky is the standard to which we expect them to do these things. I mean I agree I think we expect them to show some ability to do all of them [the performance criteria] but where is that grey line…at entry-level I would have known the basics but how to we define it? (Focus Group Supervisor #6)

Inconsistent assessment results were also evident in the pre-test results of the clinical supervisors who pilot-tested the web-based program and rated the performances of the same students (Chapter 6). In other studies, focus groups, with both recent graduates (Palermo et al. 2015b) and novice supervisors (Palermo et al. 2014a), have identified concerns regarding inconsistencies in applying current assessment practices within dietetics. Given that ten per cent of students are currently assessed as failing to reach competence by the end of their placements (Williams & Beck 2010), these findings warrant further investigation. In Study 4, data on the current assessment practices within the dietetics profession were collected. In Study 5, in addition to the assessment ratings, supervisors provided global qualitative descriptions of authentic student performances and participated in a focus group discussion. This research enabled further exploration of the assessment practices and processes within the dietetic profession.
8.5.2 Current assessment practices within the dietetic profession

Dietetics provides an exemplar when it comes to the development of the competency standards. It was one of the first health disciplines to complete the competency standards development process (DAA 1994), funded by the NOOSR. Dietetics used a functional analysis methodology to define the competency standards that considered the overall purpose of the profession and employment roles, supporting a holistic definition of competence (Ash & Phillips 2000; Gonczi 1994). The standards were developed in consultation with key stakeholders, including validation with recently graduated dietitians. The standards have been regularly revised to consider new and emerging areas of practice (Ash & Phillips 2000; Dowding et al. 2011; DAA 2015f).

The assessment of whole tasks, rather than individual performance criteria, supports a holistic definition of competence and is consistent with the assessment strategy developed with the original competency standards (Ash 1995) and the Range of Variables Statements (DAA 2010). Study 4 however, showed that some of the summative assessment forms used in ICM placements required both students and supervisors to deconstruct the student performance, stating how the student had demonstrated each individual performance criterion. In the work by Palermo and colleagues (2015b), new graduates who have participated in this process perceived the deconstruction as separate from both supervision and formative feedback.
Using performance criteria in a reductionist ‘tick-box’ manner fails to capture the original intent of the competency standards (Ash & Phillips 2000). Sound assessment practices should be holistic, situated and typically involve the assessment of several tasks (elements) simultaneously (Hager & Gonczi 1996). The examples of evidence included in the Range of Variables Statements (DAA 2010) reflect the job roles required in the workplace. For example, for Unit 4, evidence of competence includes documentation of a client’s nutrition care plan or the nutrition care process applied in an individual client counselling session. From this holistic approach, competence can be inferred with the performance criteria providing clarity on the standard required for entry-level performance (Hager & Gonczi 1996).

Care needs to be taken in the development of assessment processes including documentation through forms, that the ultimate assessment is global and outcome focused. In Study 5 some supervisors focused on the details of the consultation in their assessment, whereas others focused on the key outcomes. Global judgements have been shown to be more consistent than assessing observable behaviours (Crossley & Jolly 2012; Lambert 2011). Firstly, assessing only the components of a process, such as the steps involved in delivering a counselling session, is not necessarily a good indicator of competence (Lambert et al. 2012). The whole can be more than the sum of the parts. A student may address each of the individual steps in the Unit 4 competencies but fail to bring them together in a way that supports the client to address their nutrition problem/s. Secondly, there can be more than one way to demonstrate clinical competence (Hager & Gonczi 1996; Sheepway et al. 2014). The way schemata are constructed and used to
organise knowledge differs between learners (Schmidt & Riker 2007). The thinking process used by the learner will be influenced by their case specific knowledge and generic capabilities (Wimmers et al. 2006; Wimmers & Fung 2008) and their clinical experiences in a particular context (Lambert et al. 2012; Schmidt & Boshuizen 1993).

8.5.3 Influences on a student’s performance

In a positivist paradigm, competence is abstract, linear and stable (Govaerts & van der Vleuten 2013). Govaerts and van der Vleuten (2013) argue that work-based learning (and assessment) is actually non-linear, dynamic and context dependent. Performance is influenced by (1) the learner’s knowledge, skills and attitudes and her/his capacity to integrate and coordinate these to perform the job roles of the profession; (2) the learner’s personality traits, emotional and physical state (Khan & Ramachandran 2012 – see Figure 2.3); and (3) how the learner interacts with the task/s and the environment (Stewart & Nandkeolyar 2007). In this doctoral research these ideas can be illustrated by considering the experiences of students in different ICM settings.

The placement setting influences how student knowledge, skills and attributes need to be applied. The following example of one supervisor’s assessment of a student in consultation with an aged care resident demonstrates the influence of context on student performance and supervisor judgement.

She gave a fairly clear assessment…like your weight is stable so it looks like you are eating enough and your BGLs [Blood Glucose Levels] are well controlled so
considering your age and that you are in an aged care facility keep doing what you are doing (Focus Group Supervisor #8).

In the aged care setting, where less restrictive diets are recommended practice (ADA 2010), the performance of this student was appropriate. The context of the setting influenced the both the student’s performance and the assessor’s judgement.

Student placement experiences also influence learning trajectories. A student who has completed their first clinical placement in an aged care setting and then goes to a hospital placement may initially appear less competent to a hospital based supervisors than a student who has completed a previous placements in that setting. A new role and job setting may cause a drop in performance (Groysberg & Lee 2009), while the student needs to orientate to the new setting and learns the socio-cultural rules of engagement (Johnnson & Hager 2008). Further, different competencies will be favoured in the different settings (Ash & Phillips 2000). The following comment from a clinical supervisor from Study 6 demonstrates understanding of the challenges experienced by a student who has transitioned across placement settings.

I ‘spose it just made me sort of reflect on my transition from being you know a student to a new grad and it made a bit more sense, being able to apply it [the competency standards] in different situations…that’s another thing …don’t assume that they already know what they’re doing because they’ve got to adjust to that new setting. So if they come from a nursing home to a hospital well that’s going to be totally different and visa versa (Focus Group Participant #3).
It is helpful here to consider the influence of context-specific clinical experience on the efficiency of clinical reasoning. According to the construct of *illness scripts* and *instance scripts*, learning in a new context (case or setting) will be effortful and detailed. Student dietitians will initially tend to make their diagnoses based on theoretical, abstract knowledge. With familiarity in that clinical context, conceptual and contextual information will increasingly be used as anchor points, developing the clinician proficiency (Schmidt & Rikers 2007).

Learning transformation requires deep learning. It forces students to move beyond the procedural thinking evident in the novice and beginner stages of development and to think at an abstract level, which transcends the specifics of a particular context (Larsen & Freeman 2013). This abstract analytical level of thinking is necessary to perform at a competent stage of development (Benner 1984; Dreyfus & Dreyfus 1980) and is still used by practitioners in the proficient and expert stages in novel or unfamiliar settings. Learning transformation relies on the learner being motivated to engage with her/his experiences in both contexts. This is dependent on the student’s sense of belonging, the value the student places on the particular clinical setting (Larsen & Freeman 2013) and whether the student is able to participate within the ‘Community of Practice’ (Wenger 1998).

Through a symbiotic relationship, the clinical supervisor can facilitate student participation when the demands of the situation are extending the student beyond her/his
current stage of development (Vygotzky 1962; applied to clinical education by Webb et al. 2009). A challenge identified for student dietitians in the outpatient setting was the need to conduct the whole consultation in one setting. The setting meant that students were prevented from taking time to research a case or consult privately with their supervisor. They had to transition directly from data collection, through assessment, to developing and implementing a treatment plan. In this placement setting, student learning is most likely to be effective when her/his supervisor is able to scaffold her/his learning using approaches such as prompts, questioning, or ‘think-alouds’ (Study 5).

Research by Levett-Jones and colleagues (2008) suggests that the student-supervisor relationship (including receptiveness, inclusion, recognition and appreciation, challenge and support) is the most important influence on a student’s sense of belonging and this directly affects her/his performance and development in the workplace (Levett-Jones et al. 2008). If a student loses confidence during her/his placement it may negatively influence her/his development of competence. Maher and colleagues (2014) have found a relationship between a sense of belonging, increased confidence and performance. The following quote illustrates the relationship between performance and confidence:

She was quite harsh…I just really didn’t feel the support there, so I lost a bit of confidence in my ability to manage these patients…I just went backwards, so she could see that I didn’t feel confidence and she couldn’t pass me (Graduate 9)

Palermo et al. 2014b, p.5)
Currently the assessment of entry-level competence remains the purview of the University (DAA 2011). In Study 4 the placement coordinators reported that in most instances the university only became involved in the processes of student assessment when a student had been identified as not meeting competence within the intended placement period. This finding was also found by Palermo and colleagues (2014b) and demonstrates the high stakes currently placed on the assessments made by clinical supervisors during ICM placements. Supervisors may benefit from reassessing their role from one of assessment to one of coach, emphasising assessment ‘for’ learning rather than ‘of’ learning. The power relationship between the student and supervisors, and the stress experienced by the student, would then be reduced, facilitating a more productive learning environment.

The Dreyfus and Dreyfus’ Model of Skills Acquisition (1980) provides a theoretical construct of dietetic competence as a midpoint on a continuum of development from novice to expert, where competence is part of a journey of life-long learning. The development of competent performance is just beginning at graduation, as recognised in the provisional APD program which is aimed a continuing competency development in the first year after graduation (DAA 2013). The American Academy of Nutrition and Dietetics suggests it takes three years in one context for a practitioner to move from competent to proficient (Academy Quality Management Committee and Scope of Practice Subcommittee of the Quality of Management Committee 2013).
Competency-based assessment has aimed to measure ‘actual’ performance from observable outcomes. Research suggests that performance can in fact be constrained by the actions of other team members (Stewart & Nandkeolyar 2007). New healthcare models require a team-based approach where practitioners are able to transform and create new knowledge, continually adapting to ever-changing work practices.

8.5.4 Moving towards an interpretivist perspective

The results of Phase 3 of this research highlighted the subjective nature of assessments. Through the Delphi process and focus group discussion the supervisors’ assumptions, observations, and influence of their own experience became apparent. The supervisors’ focus on outcomes or specific details, the practice setting, the observations of other supervisors and the influence of their own personal experience and self-awareness influenced their assessments by the supervisors. Research by Kogan and colleagues (2011) has shown that the frames of reference used by assessors are complex, dynamic and highly variable, informed by assumptions and influenced by contextual factors. Govaerts and colleagues (2013) have found that assessors used personal schemas to inform their judgments of student performance. Lance and colleagues (2008) have suggested that assessor variance may in fact represent alternative, yet valid, perspectives on student performance. An alternative perspective to the positivist paradigm is to question the notion that ‘actual’ performance can be objectively measured, and rather, to consider assessments as ‘interpretations’, and ‘truth’ as a matter of ‘consensus’ among assessors (Govaerts & van der Vleuten 2013).
Through the Delphi process and the focus group discussion, supervisors were able to articulate their own values and assumptions underlying their judgements, engage in critical dialogue and reconsider their assessments in the light of these negotiations. Over the three rounds the supervisors came to a consensus in their assessments for all but one of the 11 performances. This supports the finding of Holmboe and colleagues (2004) that suggests that a discussion on a performance can lead to a shared interpretation of that performance (Holmboe et al. 2004). In a recent study by Ferguson and colleagues (2013), although not reported explicitly as a finding, a similar phenomenon was evident. The Ferguson study (2013) evaluated a designated clinical educator model that included weekly videoconferences with supervising dietitians. The benefits of a regular dialogue amongst supervisors supported a shared understanding of competent performance.

The results from Phase 3 of this research provide some evidence to support the use of assessment panels rather than individual assessors. O’Brien (2013) supports this notion but warns against the risk of ‘group think’. By using a modified Delphi approach, such as in Study 5, the unanimity of assessors’ judgements could be maintained while also allowing assessors to learn from the observations and judgements of others. O’Brien (2013) suggests that others (such as the learner) who may not be present at the panel meeting could contribute input (in this instance through a reflection) that would provide appropriate evidence to support a credible judgment.

Assessments can be improved by ensuring observations are made by multiple assessors over a duration of time, and by including more qualitative descriptions rather than relying
on just numerical ratings (Kogan et al. 2011). The tasks required for clinical competence align with the ‘relational’ (e.g. apply, integrate, analyse, transfer) and ‘extended abstract’ level of the SOLO taxonomy (reflect, create, solve from first principles) for which Biggs and Tang (2007) recommend qualitative (rather than quantitative) assessment. Qualitative narratives will provide meaningful information for panel assessments and support assessment ‘for’ learning.

Feedback from a range of sources supports a more complete view of student performance (Palermo et al. 2014b). Different sites favour the development of different competencies (Ash & Phillips 2000) and no single assessor is likely to ‘see it all’ (Crossly & Jolly 2012). Assessors are more credible when they assess their core business in contexts where these competencies can be clearly demonstrated (Crossly & Jolly 2012). As an example, dietitians who work in outpatient clinics are well placed to assess client-centred counselling within the context of a nutrition consultation. These are the right people in the right context to assess this competency.

Qualitative and quantitative methods are natural research partners (Crossley 2013). It is worth asking how qualitative and quantitative methods can work together to improve assessment practices (Schuwirth & Ash 2013). A system-oriented approach offers one such solution. Here a deliberate and arranged selection of longitudinal assessment activities (or Entrustable Professional Activities (EPAs)) is considered together as a whole to support a defensible approach to assessment (van der Vleuten & Dannefer 2012;
van der Vleuten et al. 2012). EPAs are units of professional practice (tasks or responsibilities) that are observable and measureable in their process and outcome, and executable within a given time frame (ten Cate & Young 2012). This approach has been used in medicine and requires collaboration between all stakeholders involved in the assessment process (ten Cate & Young 2012). EPA’s support a richer understanding of competence, while the system’s approach facilitates a holistic, rather than tick box, judgement of competence (van der Vleuten & Dannefer 2012). In some ways this approach is reminiscent of the original assessment strategy that was developed with the release of the first DAA competency standards (Ash 1995).

8.5.5 Conclusion

Traditionally, workplace assessment of student learning has been viewed from a positivist tradition where there is one true measurement of student competence that can be objectively measured using valid and reliable assessment tools. This approach aims to achieve generalisable results where bias can be eliminated (Govaerts & van der Vleuten 2013). In this paradigm competence is abstract, latent and stable. Work-based learning is however, non-linear, dynamic and context dependent. This thesis argues that the approach used to assess entry-level competence should move away from the notions of objectivity, validity and reliability and towards more interpretivist notions of subjectivity, credibility and defensibility.
8.6 Web-based education for clinical supervisors

Phase 4 of the research has resulted in the development of the first nationally available web-delivered program for clinical supervisors on competency-based assessment practices. The program *Feed Our Future* was developed in response to the concerns raised in this thesis about current assessment practices. The constructivist design of *Feed Our Future* incorporates problem-based learning activities, reflections and case studies, supporting transformative Web-based learning. Video-based learning material was incorporated to engage learners and as ‘anchors’ to support a better understanding of what competence ‘looks like’. The development of *Feed Our Future* was challenging for the researcher and highlighted the dependency between accessibility, usability and pedagogy.

8.6.1 Transforming assessment practices through online learning

From both positivist and interpretivist perspectives, clinical education researchers (Holmboe et al. 2010; McAllister 2006; van der Vleuten et al. 2012) have identified the need to support clinical supervisors to make quality judgement when assessing student performance during clinical placements. Van der Vleuten and colleagues (2012) have emphasised the need for professional development for assessors and have suggested the ‘… need to develop a ‘technology’ to help users to function appropriately in their assessment role (p.206)’. The challenge with clinical education is the geographical dispersion of clinical supervisors, making attendance at face-to-face education sessions impractical for some, particularly those in rural or community-based settings who may be sole practitioners. Web-based delivery offers a viable alternative being unconstrained by geographical or time boundaries. There is evidence to suggest that comparable outcomes
(satisfaction, knowledge retention and change in practice) can be achieved to those of face-to-face delivery (Maloney et al. 2011; Cook & Steinert 2013).

*Feed Our Future* was designed to support a learner-centered approach to Web-based education, as recommended by Ng’ambi & Lombe (2012) that allowed participants to be independent self-paced learners and to select content in a way that met their learning style:

> I found the program very accessible, I found it well structured, I found it sort of oriented towards self-learning, and that you could complete it in different parts (Focus Group User #5, Study 6).

Consistent with the findings of Cook and Steinert (2013) users appreciated material that was relevant, well organised and had clear expectations including time commitments.

The constructivist design of *Feed Our Future* supported transformative online learning. Constructivist pedagogy, in which learners construct their own meaning by forming connections through collaboration and reflection between their prior knowledge and new experiences (authentic real-world problems), has been recommended for online delivery (Bangert 2008; Ng’ambi & Lombe 2012). Within the discipline, Kyeong-Ju Seo and Engelhard (2014) found that clinical supervisors demonstrated improvements in the quality of their clinical education skills and practice after completing a constructivist online program. After completing *Feed Our Future* the dietitians in Study 6 felt more confidence with their assessment practices as demonstrated by this exemplar quote;
From doing this I now feel like I would be able to confidently have a final clinical placement student (Focus Group User #3; Study 6).

Participants demonstrated new understandings that aligned with the learning objectives of the program through the use of problem-based learning activities, reflections, and case studies.

In Study 6 the supervisors, prior to completing *Feed Our Future* expressed how they had found the competency standards ‘frustrating at times’ and ‘difficult to apply’. In the research by Palermo and colleagues (2015b) graduate dietitians attributed the subjectivity and inconsistency in competency-based assessment practices to variations in standards across sites and between supervisors. A problem based learning activity was therefore in *Feed Our Future* to help supervising dietitians apply the DAA National Competency Standards for Entry-Level Dietitians (2009) to their own practice setting.

Breaking down the units and elements of competency to the level of the performance criteria can support students and supervisors to develop a richer understanding of competence (Hager & Gonczi 1994). The performance criteria describe what a competent practitioner ‘looks like’ and can be usefully applied to develop a context-specific understanding of competence within each unique clinical setting. As described by Ash and Phillips (2000):
In assessing competence, assessors need to define how they themselves do things, how they know themselves to be competent and how they recognise competence in others. Judgement of an individual’s competence is based on an understanding of what competence means in a particular context (p.150).

This was demonstrated in participant responses in Study 6, as illustrated by the quote below:

I sort of never really thought about how to apply the competencies, and the types of patients, the different wards that we have in the hospitals… doing that activity where it had each of the competencies broken down and how you’d apply them …I was like, ‘oh’ I can totally figure out how to do it…(Focus Group Participant #2).

8.6.2 Using videos to engage learners and make competency-based assessment practices personally meaningful

The use of videos in web-based education can help to engage users (Azer et al. 2013; Chen et al. 2013 Kyeong-Ju Seo & Engelhard 1014; Maloney et al. 2013). Feed Our Future incorporated: (1) three video recordings from an interview with Professor Sue Ash, a member of the original taskforce that developed the competency standards and who participated in their later reviews; and (2) video-based case studies where users were required to make global assessments of performances as observed from recordings of authentic consultations. In traditional face-to-face learning programs, clinical vignettes have been used to assist supervisors to gain a shared understanding of competence in
physiotherapy (Dalton et al. 2009). *Feed Our Future* used the Model of Skills Acquisition (Dreyfus & Dreyfus 1980) as a framework to organise the videos, providing a tangible representation of development from novice to expert.

Research on assessment practices in the dietetic profession has attributed inconsistencies in the assessments of student performance, to difficulties experienced by clinical supervisors with interpreting the competency standards (Lennie & Juwah 2010; Palermo et al. 2014a). In *Feed Our Future* video material, questions to activate prior knowledge, a self-monitoring multiple choice quiz, and reflective activities were used to promote understanding of the definition, origins and development of the competency standards within the dietetic profession. The aim here was to facilitate a more consistent application of the standards by clinical supervisors to the assessment of student competence.

A holistic approach defines competence as an integrated whole that reflects an individual’s capacity to function in inherently complex workplaces (Ash & Phillips 2000; Gonczi 1994). This approach is evident in the functional analysis methodology that was used to develop the DAA competency standards (1994) that considered: (1) the overall purpose and the employment roles of dietitians (Ash et al. 2011); (2) the context of each setting; and (3) the student’s capacity to ‘bring into play’ the foundational and dietetic attributes (both tangible and intangible) required to perform successfully in a range of settings (Ash & Phillips 2000; Gonczi 1994).
Completion of the web-based program *Feed Our Future* helped the supervisors to reconsider the notion of competence as a process of development rather than a product that must be achieved by the students during the clinical placement as evidenced by the following quote:

I think the other thing that I learnt…[competence] is part of the continuum of lifelong learning from a novice to an expert as well, so it sort of gives you a bit of a different perspective on it all, so it’s not just about the student now and meeting the competencies to be able to function as a dietitian but it’s also about the long-term…(Focus Group Participant #1).

Research from Palermo and colleagues (2014a) has identified that novice supervisors felt the need for greater clarity about what competent practice ‘looks like’ both in order to create appropriate learning opportunities and for fair and transparent assessment practices (Palermo et al. 2014a). This was also evident in the assessments by the experienced clinical supervisors in Study 5 where their shared conceptual understanding of competence did not translate into a consensus in their actual assessments of the students’ performances, as observed from the video recordings. In Study 6, participants showed how the video representations of the student consultations allowed their understanding of the development of competence to become more tangible.

…You can read about it, but actually seeing the videos of an assessment, and knowing where they sit on the scale [from novice to expert]…you know we always want to see stuff in action (Focus Group Participant #3).
This is consistent with other research that suggests that assessment anchors (textural, audial and visual) can achieve more consistent assessment outcomes (Crossley & Jolly 2012; McAllister et al. 2010). The video materials incorporated into learning modules are from aged care and primary health care settings, but the assessment approach supported by the program could be applied to any ICM context.

The case studies in the program enabled the participating dietitians to compare their assessments of student performances with those made by a panel of experienced supervisors. The benefit of this approach is illustrated by the following quote from one of the participants.

We can use this process for moderation, if we have a number of different supervisors that watch a particular video, we could use it to make sure that our assessments are similar (Personal Interview Participant #9).

The approach offered by this program is promising and has potential to improve the consistency of assessment by clinical supervisors during ICM placements. There is a risk however, that this approach could be used too prescriptively. The supervisors’ assessments and case studies used authentic student-client consultations but when the supervisors made their assessments they themselves were external observers rather than being embedded in the clinical context. The supervisors did not work in these clinical settings and they were not involved in the students’ placements. The assessments were therefore decontextualised. The true benefit of this learning experience for supervisors is actually in the supervisors’ discourse.
On-line programs, such as *Feed Our Future*, have the potential to facilitate the development of an ‘interpretive community of assessors’ (Govaerts and van der Vleuten 2013), where supervisors are able to articulate their own values and assumptions underlying their judgements, engage in critical dialogue and reconsider their assessments in the light of these negotiations, supporting the development of a shared understanding of competent performance. An online forum and video recordings of student-client consultations can support supervisors to engage in a discourse on the merits of individual student performances. Assessments by supervisors may in fact be different, reflecting an alternative, but equally credible, perspective (Lance et al. 2008).

8.6.3 The interdependence of pedagogy, accessibility and usability

Collaboration was a key feature of the constructivist pedagogy used for *Feed Our Future*, and can be supported within a virtual community using a central online discussion forum (Parks 2011). The discourse between supervisors on the assessment of student performances was central to developing a shared understanding of competence in such a way that it was sufficiently flexible to accommodate the dynamic nature of the future workforce (Study 5). Conversational discussion and social bonding are seen as key factors for engagement with online education (Cook & Steinert 2013). The participation rates for the discussion forum in Study 6, however, were lower than expected. Possible solutions to address the lack of engagement with discussions may include more active moderation on the forum, blended online learning with face-to-face contact, a social
media approach that conforms to workplace security restrictions, or more assistance with technical problems (Cook & Steinert 2013).

Effective online delivery must consider the usability and accessibility of the program [22, 23]. IT access and capacity at some worksites limited engagement with Feed Our Future:

I’m computer literate but not really up-to-speed with some technological advances I suppose. I was a bit frustrated with some of those things…I suppose once I get annoyed with something I’m not inclined to go back (Personal Interview User #7; Study 6).

Technical barriers experienced in the pilot-testing of Feed our Future such as IT incompatibilities between the infrastructure of organisations software and Internet browsers, security restrictions, and bandwidth limitations are not unique (Park 2011). Universities have very few security restrictions and are able to use programs such as YouTube to achieve positive learning outcomes (Kent 2013). Awareness that this freedom may not be available in some health settings is required if effective online programs are to be available for use by clinical supervisors working in these settings. Feed our Future, like many programs (Brit 2006; Kowalczyk 2014) was developed on a limited budget. Lack of IT expertise, infrastructure and associated software, were limitations to the development of the program. Two years were required to complete the design-based research approach. Despite the advantages, the development requirements
for online programs are more labor intensive than face-to-face delivery (Brit 2006; Kowalczyk 2014).

*Feed Our Future* provides a case example that demonstrates the value of a design-based research and consultative approach for the development of web-based programs that could be applied elsewhere in the dietetic profession. It was developed in response to an identified need within the dietetics profession. It was informed by a literature review and evidence from Studies 1 to 5, and refined through an iterative process of formative feedback and reflection in consultation with key stakeholders. This included an advisory group consisting of industry, academic, student, consumer and regulatory representation that provided direction on the research and the development of the program. The program was trialed, at an early stage, by dietitians and formative feedback incorporated. Feedback was sought from the professional association. In the final stages the program was pilot-tested and evaluated by the clinical supervisors who were the potential end-users. This process has resulted in an online program that offers a viable solution for universities to provide professional development to geographically dispersed clinical supervisors in preparation for student placements.

### 8.6.4 Conclusion

*Feed Our Future* is the first nationally available web-based program to support clinical supervisors to achieve more credible and defensible assessments of student performance. The pedagogical design of the program supports independent self-paced learning,
catering for different learning styles. The use of authentic student-client consultations, problem-based learning activities and reflections supported the supervisors to demonstrate new understandings that aligned with the programs learning objectives. The design-based research approach highlighted the pedagogical, usability and accessibility considerations with the iterative process and the end-user involvement facilitating the identification of barriers to effective educational outcomes.
Chapter 9: Recommendations for practice arising from these doctoral studies

This chapter considers, in the context of other academic literature, the practical implications of the findings of this research for ICM placement curricula, clinical placement preparation and delivery, competency-based assessment practices and the potential for web-delivered education to support clinical placement programs.

9.1 Recommendations for Placement Curricula

Based on this research it is recommended that ICM clinical placement curricula be expanded to include settings outside the hospital, such as aged care facilities and outpatient clinics. These settings have been shown to provide experiences that align well with current healthcare and workforce needs (consistent with Rhen & Beetles 2012). Innovative models of clinical education, including role-emerging placements, should also be explored. These settings may assist students to develop generic capabilities, extend professional boundaries, and redistribute the workforce to areas that are currently underserviced. (This finding is consistent with CETQ 2011; Dancza et al. 2013; Grealish et al. 2013; Gat & Ratzon 2014; Kassam et al. 2013). Successful placement experiences in new areas of practice can contribute to healthcare delivery demonstrating the benefit of dietetic services. In other disciplines role-emerging placements have lead to job creation (Kearsley 2012). The inclusion of a range of clinical settings requires students to transform their learning across different contexts. The development of such flexibility is likely to be highly valued in the future workforce (Bosanquet et al. 2006; HWA 2011).
The sequence of clinical placement experiences provided for each student should align with their stage of development, where students can become active participants within the ‘community of practice’ (Lave & Wenger 1991). Through a symbiotic relationship (Vygotzky 1962; Webb et al. 2009) supervisors can extend students beyond their current stage of development. For example, in the outpatient setting clinical supervisors can support students to transition directly from data collection, through the assessment and development and implementation of their treatment plan using scaffolding approaches such as prompts, questioning or ‘think alouds’.

9.2 Clinical Placement Preparation and Delivery

Learning milestones have been provided to describe the likely progression of students during ICM clinical placements. Research by Palermo and colleagues (2014a) suggest that these milestones are helpful to both dietitian supervisors and students. Given that the development of competence is context dependent (Johnnson & Hager 2008) with different sites favouring the development of different competencies, milestones developed for the hospital setting will not necessarily reflect the learning trajectories of students who complete ICM placements outside these settings.

A practical application from this thesis has been the development of new clinical placement milestones for students completing placements in outpatient, aged care and hospital ICM settings (see Appendix 5). Govaerts and van der Vleuten (2013) warn that
milestones are limited in that they oversimplify arbitrary stages in the process of professional development. These milestones should therefore not be used prescriptively but rather be used to consider how the learning pathways of students might differ.

Transformational learning requires students to create, rather than merely reproduce knowledge (Larsen-Freeman 2013). Students who complete ICM placements across a range of settings may require support to transform their learning across different contexts. Given the relationship between confidence and the development of competence (Maher et al. 2015) it is essential that students be provided with supportive learning environments during their clinical placements to enhance a sense of belonging (Levett-Jones et al. 2008). Using the theoretical framework provided by Larsen-Freeman 2013 on transformative learning, some practical recommendations are presented below to support students in their transition between ICM placement settings.

Recommendations for placement academics and site supervisors:

1. Adopt a collaborative, rather than a hierarchical approach to ICM placements, where the contributions of all dietitians are equally valued.

2. Support students to participate in learning experiences where they are required to think conceptually (rather than procedurally).
3 Help students to identify the similarities between clinical settings by ‘intercontextualising’ their learning so they can see the relevance of, and similarities between, the learning content at different placement sites.

4 Help students to see the nuanced practice differences between settings and support them to develop the localised knowledge necessary to function successfully in each clinical setting.

Students are presented with a plethora of patient information. They need to learn new skills to navigate through the information sources, interpret the data and identify what is relevant to the dietetic care of their patient. *(This is quite different to their experience in outpatient and aged care settings.)* To assist students to prepare for this placement, a web-based program has been developed for students to complete prior to completing their hospital placement (see Appendix 6).

9.3 Competency-Based Assessment Practices

There is a need to align the theoretical foundations and the practice application of the competency standards. A holistic definition of competence needs to be adopted in practice where the final assessment of competence is inferred from observable performances (in simulated and workplace settings) and assessed using whole tasks that consider the coordination and integration of the competencies. The new DAA competency standards (DAA 2015d; Appendix 2) no longer contain the units of
competence for the critical practice areas but rather use four broad domains: (1) practices professionally; (2) positively influences the health of individuals, groups and/or populations to achieve nutrition outcomes; (3) applies critical thinking and integrates evidence to practice; and (4) collaborates with clients and stakeholders. This approach is consistent with the interpretation of the competency standards used in this research, where the application of the standards in ICM requires students to ‘bring into play’ the dietetic skills and the foundational competencies (Ash & Phillips 2000). Competence is more than what is observed from performances; but rather it requires the student to have the capacity to transform their learning across different contexts (cases and settings).

Supervisor assessments made on the basis of a student’s ‘observed’ performances in the workplace provide key sources of evidence to evaluate whether the student is safe for independent practice as a graduate dietitian. Clinical supervisors therefore need be supported to apply the competency standards within their own clinical context. This will enable them to provide feedback to assist students in their development of competence as well as prompting their own self-assessment and professional development. When supervisors use a global outcome focused approach to assessment, they are more likely to reach a consensus in their judgements (Govaerts et al. 2002). Assessments also need to consider the student’s familiarity with the particular clinical setting. Students will require more support when the context is unfamiliar or when the case includes a level of complexity (McAllister et al. 2010). The Behavioural Descriptors published by McAllister and colleagues (2006) provide a useful resource to assist clinical supervisors to consider a student’s familiarity with a clinical setting or case, in order to provide more
meaningful feedback on her/his performance and assist in her/his professional development.

This thesis posits that competence-based assessment should be considered using the interpretivist notions of subjectivity, credibility and defensibility rather than the positivist notions of objectivity, reliability and validity. Consistent with the work of Schuwirth and van der Vleuten (2003), assessments by clinical supervisors can be viewed as ‘interpretations’ rather than judgments of ‘truth’. Within this framework assessment of competence may be based on the ‘consensus’ of a panel of trained assessors who look for patterns of performance based on evidence from a range of sources over time. It is strongly advised that one clinical placement supervisor does not make a definitive assessment of competence at the end of a student’s placement program. The final decision is best supported by a credible and defensible ‘saturation’ of evidence.

It is recommended that the role of clinical supervisor during ICM placements be that of an ally rather than a judge, emphasising assessment ‘for’ learning rather than assessment ‘of’ learning (Boud 2010). This approach limits the risks associated with the power relationship that is evident in clinical placement experiences between students and clinical supervisors (Kell 2014) and may foster ‘observed’ student performances that more accurately emulate ‘actual’ performance. It is important to recognise that by the end of their placement program students are only at the beginning of the competence
stage of development as present by the Model of Skills Acquisition (Benner 1984; Dreyfus and Dreyfus 1980).

The use of qualitative narratives by clinical supervisors, rather than a ‘tick-box’ approach to assessment, may better support assessment ‘for’ learning (Biggs & Tang 2007) and may also provide richer more meaningful information for the assessment panel (Kogan et al. 2011). It is recommended that clinical supervisors be asked to provide feedback that aligns with their core business and the elements of competency favoured in their setting (Crossly & Jolly 2012). As student performance during placement is dependent on the learning context, their performances may in fact be constrained by the actions of other team members (Stewart & Nandkeolyar 2007). More work is required to determine the best way to assess competence in the workplace in a team context (Govaerts and van der Vleuten 2013).

Credible and defensible assessment practices require assessors to have a sufficiently rich understanding of competence to support the flexibility required to apply the competency standards in different settings within the context of a dynamic healthcare system (Larsen-Freeman 2014). The deconstruction of the units of competence to the level of performance criteria can support supervisors (and students) to develop a richer understanding of competent performance that can be usefully applied to different clinical settings. Videos of authentic student performances can help to make abstract concepts tangible, provide anchors to support the assessment of student performances and can be
used to stimulate a discourse within the profession on competent performance. Through an ‘interpretive community’ assessors can clarify their judgements, identify their assumptions and reconsider their assessments in the light of the observations and experience of others.

9.4 Web-Delivered Education to Support Clinical Education

Web-based programs offer a viable platform for professional development to support the delivery of clinical placements, unconstrained by geographical or time boundaries. Design-based research offers a useful process to develop such programs that consider pedagogy, accessibility and usability concurrently. A constructivist design using self-paced problem-based learning, reflections and case studies can support engaging, transformative Web-based learning and caters for different learning styles. The material should be relevant, well organised and have clear expectations including time commitments. Currently there are barriers to the effective use of web-delivered program such as lack of compatibility between organisations infrastructure, bandwidth limitations and security restrictions need to be considered.

*Feed Our Future* is a national available research and web-based program designed to support clinical supervisors to achieve more credible and defensible competency-based assessment practices during clinical placements. The program is available to member of DAA through Dietetic Information and Nutrition Education Resource (DINER) database.
9.5 Recommendations for Further Research

The SAS case study evaluated the service from the perspective of stakeholder satisfaction. Further evaluation of the SAS model could consider additional questions such as: (1) Was the SAS service economically sustainable? (2) Were their improvements in client / resident health outcomes / quality of life as a result of using the SAS service? (3) What were the learning outcomes of the students who attended the SAS clinical placement? and, (4) How well prepared for their hospital ICM placement were the students who attended the SAS for their first ICM placement?

There is a need to measure the outcomes of students who complete supervised practice in ICM placements outside the hospital setting. Do these placement settings influence the future career paths of students? Are the graduates better equipped for the demands of the future workforce? What is their capacity to demonstrate flexibility, creativity or innovation in their approach to practice? Traditionally, new graduates seek employment in the hospital setting where the team environment supports clinical supervision and mentoring processes. However, graduates are increasingly working in sole positions and in private practice. In addition to the provisional APD program (DAA 2015a), research is required to determine the best ways to support new graduates in emerging areas of practice. The most recent version of the DAA competency standards (DAA 2015d) does not specify areas such as ICM. It is expected that these new standards will further progress the movement of clinical placements into emerging areas of practice. Within this context there will be opportunity to explore placement models such as role-emerging placements within dietetics.
More evidence is required to support the use of: (1) assessment panels or a Delphi approach to reach consensus in assessments made during clinical placements; and (2) the value of professional discourse to gain a shared understanding of competent performance. This research should focus on student outcomes for both ICM placements and for students who are assessed using an, ‘interpretivist’ approach to competency-based assessment. Further research may consider the career implications of clinical placement assessments. How does a ‘failed’ clinical placement impact on the student? Is their assessment outcome reflective of their later contribution to the health profession? The relationship between confidence and competence also warrants further investigation. This research suggests a possible relationship between the capacity of a student to transform their learning across clinical settings and achieve a competent stage of performance. This requires further investigation. Given the movement towards interdisciplinary practice, individualised competency based assessment practices may not be the most appropriate. Further research is required with consideration of competence as collective, situated, transformative and expansive.

9.6 Strengths and Limitations of the Research

This research has explored practice problems in clinical education and workforce development using a pragmatist philosophy (Pansiri 2005) and a mix-method approach (Creswell & Plano Clark 2007). The selection of methods has been determined by the research aims and objectives. This research has used a mixed-model design (Johnson & Onwuegbuzie 2013) combining qualitative and quantitative approaches within and across
the research phases and studies with the intention of generating a greater depth and breath of evidence. This non-purist position is compatible with the interdisciplinary, complex and dynamic nature of clinical education (Camille 2014).

The evaluative case study undertaken in Phase 1 allowed the exploration of a context-specific example of an ICM placement outside the hospital setting. Given that most universities are using hospital settings for their ICM placements, this method is appropriate as it is a unique context (Zainal 2007). The triangulation of data from the three different studies in Phase 1 strengthened the findings (Yin 2011). While the results considered alone are not generalisable, when placed together with the other phases of the research support the thesis and contribute to the body of knowledge about innovative models of education, non-hospital settings and workforce development.

The SERVQUAL instruments used in Study 1 have been validated for use in clinical settings (Pakdil & Harwood 2005) and were adapted to fit the characteristics of the SAS setting. A positive GAP score was achieved, demonstrating customer satisfaction. This study did not include client-generated weights for each dimension (Parasuraman et al. 1991), which would have allowed greater insight into the individual quality constructs supporting targeted service quality improvements. Data was missing for some questions that may have been prevented by improved question design. Pairwise exclusion of missing data was used in the statistical analysis to overcome this limitation. The sample for this study provides meaningful results but is small when compared to other similar
Although SERVQUAL is a widely accepted and applied instrument to measure service quality and client satisfaction, a recent publication by Schembri (2015) has raised some questions in regard to the application of SERVQUAL to the health care context. Her qualitative narrative analysis suggests that patient satisfaction and service quality may not accurately reflect consumer experience with health care in Australia. Her research highlights the need to consider the patient experience experientially and holistically. Tools such as SERVQUAL may fail to capture the ‘complexity and the layered depth to the patient’s perspective’.

The methods used for Study 2 supported the exploration of this unique student-assisted service in residential aged care facilities and helped to overcome the methodological challenges associated with using older participants (Atwal & Caldwell 2005). Within the context of this thesis, the study makes only a small contribution and as such only overarching themes are presented in Chapter 3. Unfortunately these themes did not allow the full richness of the residents’ stories with the SAS to be presented. This is an area that warrants further investigation.

Although efforts were made to maximise the response rate (Dillman 2009) the low participation rate in Study 3 means that these results may not be representative of the perspective of all students and should be interpreted with caution. Over recent years there
has been a decreasing trend with response rates to web-based surveys (Fernandez et al. 2012). This has been attributed to the increasing demand to participant in web-based survey, a decreased novelty with the web-based mode and an increase prevalence of spam and IT viruses (Fernandez et al. 2012). The offer of a post-completion incentive may have helped to increase the response rates (Birnholtz et al. 2004). The research instrument was developed using a robust process but had not been previously validated. In retrospect, a qualitative approach may have produced more meaningful and in depth findings about the students’ experiences both in the hospital and SAS settings.

The sequential mixed-methods approach used in Phase 2 allowed Study 4 (a web-based survey) to inform the methods used in Study 5 (a modified Delphi-study). The process used for the design of the DPMQ was robust and the response rate was sufficient to provide a national context for the thesis. On reflection, the instrument could have been further improved with the incorporation of definitions for assessment approaches and placement settings to ensure all participants used the same interpretation.

The methods used in Study 5 are robust (see Manuscript 3) and comparable to other similar studies (Ash 1995; Davies et al. 2009; Norcini et al. 2003). The limitations of this research reflect the inherent challenges of work-based assessments. Competence cannot be judged from a single performance and the assessments of the client consultation although authentic, were decontextualised. Provided the results are interpreted with this understanding the findings can make a valid contribution to the body of knowledge
around competency-based assessment practices within the health professions. The results offer expert opinion rather than indisputable fact, but are consistent with other contemporary research within the dietetics profession (Palermo et al. 2014a, 2014b) calling for greater alignment between the theoretical intent of the competency standards and their practice application.

The final Phase 4 of this research draws together the findings from the previous studies. The literature review, research findings and video recordings from Study 5 strengthen the design-based research method. This study is consistent with a pragmatist framework, offering a solution focused approach to: (1) the concerns raised about competency-based assessment practices in Study 5, and (2) disseminate the opportunities arising from the use of ICM placements outside the hospital setting. The study combines qualitative and quantitative feedback from the participants’ strengthening the iterative process. The findings of the research are presented from a pedagogical perspective but support the overall thesis statement that ICM settings outside the hospital provide appropriate placements for student dietitians to develop and demonstrate ICM competence.

9.7 Conclusion

Placements in hospital settings outside the hospital can support the development of ICM competence, prepare students for the future workforce and support the delivery of healthcare in underserviced settings. The development of competence is a journey of learning that requires the application of knowledge, skills and attitudes to the complex
challenges of the workplace but it is also the ability to continually adapt to change, to reflect and collaborate, to create new understandings and to transform learning. This approach to competence is consistent with current healthcare and workforce demands that require flexible clinicians who are able to work collaboratively in interprofessional teams in a variety of settings. Constructivist video and web-based learning programs, like *Feed Our Future*, and participation in an ‘interpretivist community of assessors’ can help clinical supervisors to gain a more credible and defensible approach to competency-based assessment. This research supports a mixed-method approach to assessment with the aim of achieving a more comprehensive and in-depth understandings of students’ development and demonstration of ICM competence.
The Contribution of this Research

Implications for ICM Placement Programs

This research provides evidence to support the expansion of ICM placement settings to include community-based settings such as aged care and outpatient clinics. Growth in the dietetics workforce is not in the hospitals but rather in the community, yet these findings have shown that nationally most universities are using hospitals for Individual Case Management (ICM) placements demonstrating a practice hierarchy. This research provides expert opinion that student dietitians are able to develop and demonstrate ICM competencies in outpatient and residential aged care settings. An evaluation of an innovative service has demonstrated the potential to deliver a high quality learning experience for students and contribute to health service delivery in underserviced community settings.

This research suggests that the addition of community settings to ICM placements provide experiences that better align with current healthcare and workforce needs. Rather than a hierarchical view, this research supports an ICM placement program that allows a mix of settings (hospital, community and aged care) facilitating a greater depth and breath of experience. Evidence shows that different placement settings favour the development of different competencies influencing a student’s learning trajectory. Adjustments are needed to allow for the nuanced practice differences between settings in order to support optimal learning and assessment practices.
Implications for ICM Assessment Practices

This research provides evidence that currently ICM clinical supervisors are (1) taking prime responsibility for assessing the competence of student dietitians; (2) using assessment tools based on traditional, rather than evidence-based practices; and (3) showing inconsistencies in their assessments of student performance. Evidence is presented to support a reframing of assessment of competence away from the notions of objectivity, validity and reliability towards the more interpretivist notions of subjectivity, credibility and defensibility. This thesis argues for a mixed-method approach to assessment with the aim of achieving a ‘saturation’ of evidence testifying to a student competence.

These findings suggest that web-based constructivist pedagogy, using video-based materials and an online discussion forum, can support clinical supervisors to develop a shared understanding of competence. The modified-Delphi study showed how supervisors, through dialogue, were able to achieve consensus in their assessment by sharing their observations, acknowledging their assumptions and re-assessing their judgements. The culmination of this thesis is the development of the first web-based program for clinical supervisors to support more credible and defensible competency-based assessment practices. The design-based research approach used to develop the program is described, offering a practical solution to identify usability and accessibility barriers to effective educational outcomes.
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Appendices

Appendix 1 Operational Definitions

Clinical Supervisor: A clinical dietitian who guides a student’s education and training during their clinical placement. The clinical supervisor is responsible for ensuring safe, appropriate and high-quality client care.

GP Super Clinic: Medical facilities that support general practitioners, nurses, visiting medical officers & allied health, generally in a single location, working together to deliver coordinated care to a community.

Individual Case Management (ICM): Individual case management refers to a critical area of practice within the dietetics profession and is covered in Unit 4 of the Dietitians Association of Australia National Competency Standards for Entry-Level Performance.

Medicare Local / Primary Health Care Networks: Primary healthcare organisations that coordinate primary health care delivery at a local level.

Non-traditional Placement Settings: Settings where community based individual dietetics care is provided including private and public outpatient clinics, home visits and services provided to residential aged care facilities.

Primary Health Care: Overarching term referring to the provision of access to community based health care including prevention, diagnosis and treatment.

Residential Aged Care Facility: Residential aged care is for older people who can no longer live at home and provides permanent high and low level care, and respite high and low level care.
**Rural:** Refers to non-metropolitan areas, research conducted in coastal communities where the town’s population is less than 5000.

**Workforce Flexibility:** The capacity to work competently across a range of workplace settings such as within a hospital, private practice or residential aged care setting.
Appendix 2 New Competency Standards (DAA 2015d)

National Competency Standards for Dietitians in Australia

The National Competency Standards for Entry-Level Dietitians in Australia were originally published in 1993 by DAA and were previously reviewed in 1998, 2005 and 2009. The current revision occurred in 2014 and was endorsed by DAA in 2015.

The National Competency Standards for Dietitians in Australia are used to facilitate a shared understanding of competency. More specifically they are used by:

**Students to:**
- Identify the relationship between their program of learning, assessment and program outcomes
- Determine what they are expected to do by the end of their university study (on entry to the profession)
- Guide their plans for professional development as part the Accredited Practising Dietitian program

**Practitioners to:**
- Provide a framework for assessment of students
- Guide professional development plans for the Accredited Practising Dietitian mentoring program
- Describe minimum performance in the workplace

**Universities to:**
- Design and implement dietetic education programs that are compliant with the DAA Accreditation Standards
- Develop curricula and assessment strategies that are aligned with the Competency Standards
- Graduate entry-level dietetic practitioners that are competent against the Competency Standards.

**DAA to:**
- Inform standards for accreditation of university programs
- Guide the assessment processes of dietitians whose qualifications are not from Australia wishing to practise in Australia
- Guide assessment processes for dietitians returning to practice
- Describe safe performance in the workplace
- Describe dietetic practice in Australia and inform international benchmarking

**By patients, clients and the community to:**
- Establish the expected knowledge, skills and behaviours of dietitians and provide the standards against which the public can expect safe practice

### Domain 1. Practises professionally

<table>
<thead>
<tr>
<th>Key Tasks/Elements</th>
<th>Observable and/or measurable actions</th>
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<tbody>
<tr>
<td><strong>1.1 Demonstrates safe practice</strong></td>
<td>1.1.1. Reviews and evaluates the impact of own practice on improving nutritional health</td>
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<td></td>
<td>1.1.2. Recognises own professional limitations and the profession's scope of practice and seeks assistance as necessary</td>
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<td>1.1.3. Accepts responsibility for and manages, implements and evaluates own personal health and well-being</td>
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<td>1.1.4. Shows a commitment to professional development and conduct, and lifelong learning</td>
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<td></td>
<td>1.1.5. Consistently demonstrates reflective practice in collaboration with supervisors, peers and mentors</td>
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<td></td>
<td>1.1.6. Accepts responsibility for own actions</td>
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<td></td>
<td>1.1.7. Demonstrates flexibility, adaptability and resilience and the ability to manage own emotions</td>
</tr>
<tr>
<td><strong>1.2 Practises within ethical and legal frameworks</strong></td>
<td>1.2.1. Exercises professional duty of care in accordance with relevant codes of conduct, ethical requirements and other accepted protocols</td>
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<tr>
<td></td>
<td>1.2.2. Demonstrates integrity, honesty and fairness</td>
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<td></td>
<td>1.2.3. Prepares appropriate documentation according to accepted standards</td>
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<td><strong>1.3 Demonstrates professional leadership</strong></td>
<td>1.3.1. Uses negotiation and conflict resolution skills when required</td>
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<td></td>
<td>1.3.2. Develops and maintains a credible professional role by commitment to excellence of practice</td>
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<td></td>
<td>1.3.3. Seeks, responds to, and provides, effective feedback</td>
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<td></td>
<td>1.3.4. Participates in mentoring</td>
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<td></td>
<td>1.3.5. Demonstrates initiative by being proactive and developing solutions to problems</td>
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<td><strong>1.4 Practises effectively</strong></td>
<td>1.4.1. Applies organisational, business and management skills in the practice of nutrition and dietetics (effective time, workload and resource management)</td>
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<td></td>
<td>1.4.2. Utilises suitable evaluation tools to review effectiveness of practice</td>
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<td></td>
<td>1.4.3. Identifies and assesses risks, follows risk management protocols and develops basic risk management strategies for services</td>
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<td></td>
<td>1.4.4. Utilises relevant technology and equipment efficiently, effectively and safely</td>
</tr>
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<td></td>
<td>1.4.5. Applies the principles of marketing to promote healthy eating and influence dietary change</td>
</tr>
<tr>
<td><strong>1.5 Demonstrates cultural competence</strong></td>
<td>1.5.1. Reflects on own culture, values and beliefs and their influence on practice</td>
</tr>
<tr>
<td></td>
<td>1.5.2. Seeks out culturally specific information to inform practice</td>
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<td></td>
<td>1.5.3. Works respectfully with individuals, groups and/or populations from different cultures</td>
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## Domain 2: Positively influences the health of individuals, groups and/or populations to achieve nutrition outcomes

<table>
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<tr>
<th>Key Tasks/Elements</th>
<th>Observable and/or measurable actions</th>
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</table>
| 2.1 Applies an evidence-based approach to nutrition and dietetics services | 2.1.1 Collects, analyses and interprets relevant health, medical, cultural, social, psychological, economic, personal, environmental, dietary intake, and food supply data in determining nutritional status  
2.1.2 Makes appropriate nutrition diagnoses and identifies priority nutrition issues based on all available information  
2.1.3 Prioritises key issues, formulates goals and objectives and prepares goal oriented plans in collaboration with patient/client or carer, community/population/service, other members of the healthcare team, key stakeholders and partners  
2.1.4 Implements, evaluates and adapts nutrition care plans/programs/services in collaboration with patient/client or carer, community/population/service and other members of the healthcare team or key stakeholders and partners |
| 2.2. Influences the food supply to improve the nutritional status of individuals, groups and/or populations | 2.2.1 Applies an approach to practice that recognises the multi-factorial and interconnected determinants influencing nutrition and health  
2.2.2 Identifies opportunities and advocates for change to the wider social, cultural and/or political environment to improve nutrition, food standards or the food supply in various settings  
2.2.3 Acknowledges the multiple factors that influence food choice and the provision of service  
2.2.4 Uses food legislation, regulations and standards to develop, implement and evaluate food systems to maintain food safety  
2.2.5 Applies a socio-ecological approach to the development of strategies to improve nutrition and health |
| 2.3 Facilitates optimal food choice and eating behaviours for health | 2.3.1 Applies a highly developed knowledge of nutrition science, health and disease, food and food preparation methods to tailor recommendations to improve health of individuals, groups and/or populations  
2.3.2 Displays effective active listening, interviewing and interpersonal skills to better understand perspectives of clients, carers, groups and key stakeholders to inform approaches and influence change  
2.3.3 Uses client-centred counselling skills to negotiate and facilitate nutrition, behaviour and lifestyle change and empower clients with self-management skills |
### Domain 3. Applies Critical Thinking and Integrates Evidence into Practice

<table>
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<tr>
<th>Key Tasks/Elements</th>
<th>Observable and/or measurable actions</th>
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| **3.1 Uses best available evidence to inform practice** | 3.1.1 Adopts a questioning and critical approach in all aspects of practice  
3.1.2 Gathers, critiques, uses and shares research and information to support sound decision making with key stakeholders  
3.1.3 Applies problem-solving skills to create realistic solutions to nutrition problems or issues |
| **3.2 Conducts research, evaluation and quality improvement processes using appropriate methods** | 3.2.1 Identifies and selects appropriate research methods to investigate food and nutrition problems  
3.2.2 Applies ethical processes to research and evaluation  
3.2.3 Collects, analyses and interprets qualitative and quantitative research and evaluation data  
3.2.4 Accurately documents and disseminates research, quality improvement and evaluation findings |

### Domain 4. Collaborates with Clients and Stakeholders

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<th>Key Tasks/Elements</th>
<th>Observable and/or measurable actions</th>
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| **4.1 Communicates appropriately with individuals, groups, organisations and communities from various cultural, socio-economic, organisational and professional backgrounds** | 4.1.1 Practises in a manner that encompasses the needs, preferences and perspectives of others  
4.1.2 Demonstrates empathy and establishes trust and rapport to build an effective relationship with client, carers, families, colleagues, community and other key stakeholders  
4.1.3 Translates technical information into practical advice on food and eating and other relevant topics  
4.1.4 Adapts and tailors communication appropriately for specific audiences  
4.1.5 Communicates clearly and concisely to a range of audiences using a range of media |
| **4.2 Builds capacity of, and collaborates with, others to improve nutrition and health outcomes** | 4.2.1 Shares information with, and acts as a resource person for colleagues, community and other agencies  
4.2.2 Identifies, builds relationships with and assists in implementing plans with key stakeholders who have the capacity to influence food intake and supply  
4.2.3 Empowers individuals, groups and/or the broader community to improve their own health through engagement, facilitation, education and collaboration |
| **4.3 Collaborates within and across teams effectively**                          | 4.3.1 Promotes a high standard of nutrition care, while respecting the goals and roles of clients and other professionals, key stakeholders or groups  
4.3.2 Participates in collaborative decision making, shared responsibility, and shared vision within a team  
4.3.3 Shares responsibility for team action, recognising the diverse roles and responsibilities other team members play  
4.3.4 Guides and supports other team members and peers  
4.3.5 Actively promotes the role of a Dietitian and the broader profession of nutrition and dietetics |
Appendix 3 Ethics Approval

7 December 2012

Assistant Professor Rachel Bacon
Discipline of Nutrition and Dietetics
Faculty of Health
University of Canberra
Canberra ACT 2601

Dear Rachel,

The Human Research Ethics Committee has considered your application to conduct research with human subjects for the project Developing an on-line technology to support supervisors in their assessment of Dietetic student’s competency development in non-traditional settings.

Approval is granted until 30/06/2013, the anticipated completion date stated in the application.

The following general conditions apply to your approval.

These requirements are determined by University policy and the National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council, 2007).

<table>
<thead>
<tr>
<th>Table</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monitoring:</strong></td>
</tr>
<tr>
<td><strong>Discontinuation of research:</strong></td>
</tr>
<tr>
<td><strong>Extension of approval:</strong></td>
</tr>
<tr>
<td><strong>Retention and storage of data:</strong></td>
</tr>
<tr>
<td><strong>Contact details and notification of changes:</strong></td>
</tr>
</tbody>
</table>

Please add the Contact Complaints form (attached) for distribution with your project.

Yours sincerely
Human Research Ethics Committee

Hendryk Flaegel
Ethics & Compliance Officer
Research Services Office
T (02) 6201 5220 F (02) 6201 5466
E hendryk flaegel@canberra.edu.au

FEED OUR FUTURE: A pragmatist mixed methods exploration of Individual Case Management (ICM) placements outside the hospital setting.
26th October 2011

Ms Rachel Bacon
Faculty of Health
University of Canberra
BRUCE ACT 2617

Dear Rachel,

The Committee for Ethics in Human Research has considered your application to conduct research with human subjects for the project entitled Client satisfaction with student-led Dietetic Services.

**Approval is granted until 19/11/12 the anticipated completion date stated in the application.**

The following general conditions apply to your approval.

These requirements are determined by University policy and the National Statement on Ethical Conduct in Research Involving Humans (National Health and Medical Research Council, 2007).

| Monitoring: | You, in conjunction with your supervisor, must assist the Committee to monitor the conduct of approved research by completing and promptly returning project review forms, which will be sent to you at the end of your project and, in the case of extended research, at least annually during the approval period. |
| Discontinuation of research: | You, in conjunction with your supervisor, must inform the Committee, giving reasons, if the research is not conducted or is discontinued before the expected date of completion. |
| Extension of approval: | If your project will not be complete by the expiry date stated above, you must apply in writing for extension of approval. Application should be made before current approval expires; should specify a new completion date; should include reasons for your request. |
| Retention and storage of data: | University policy states that all research data must be stored securely, on University premises, for a minimum of five years. You and your supervisor must ensure that all records are transferred to the University when the project is complete. |
| Changes in contact details: | You should advise the Committee of any change of address during or soon after the approval period including, if appropriate, email address(es). |

Please add the Contact Complaints form (attached) for distribution with your project.

Yours sincerely
Committee for Ethics in Human Research

Michaela Dalgleish
Ethics & Compliance Officer
Research Services Office
T (02) 6201 5870 F (02) 6201 5466
E Michaela.Dalgleish@canberra.edu.au

FEED OUR FUTURE: A pragmatist mixed methods exploration of Individual Case Management (ICM) placements outside the hospital setting.
Appendix 4 Full Details of Phase 1 Studies 1-3

Introduction

The aging population profile in the developed nations, with rising prevalence of chronic disease increases the need for dietetic services.\(^1\) In the United States it is predicted that the population over 65 years will grow by 36% between 2000 and 2020.\(^2\) Currently insufficient numbers of dietitians work in geriatric care to meet demand, particularly in institutionalized care.\(^3\) At the same time, the United States is characterized by a high prevalence of adult obesity\(^5\) resulting in higher rates of chronic disease and increased health care costs.\(^6\) The health care reform agenda targets chronic disease prevention and is likely to drive an increased demand for dietetic counselling services in primary care.\(^7\) In the United States it is predicted that by 2020 only 75% of the current demand for dietetic professionals will be met.\(^8\)

A potential barrier to increasing the dietetics workforce capacity is the current shortage of internships.\(^9\) Traditionally, dietetics education has relied on hospitals using a one-on-one preceptor model.\(^9\) Although new approaches of supervised practice such as team teaching\(^10\) have been trial these are unlikely to be sufficient to meet placement demand. In 2011 the United States reported a projected need for an additional 1855 internship positions.\(^11\) The ACEND Accreditation Standards no longer requires student to meet competencies in prescribed locations.\(^12\) There is a need to explore innovative models of clinical education in non-hospital settings.
In the United States student-led clinics, many of which are multidisciplinary, deliver health care in underserviced areas providing over 36,000 consultations annually. Student involvement in these clinics is predominantly voluntary, with limited supervision and therefore contributes to preparatory learning rather than supervised practice. In Australia student-assisted health services have used a paid preceptor model and have increased supervised practice opportunities in outpatient and aged care settings. Clinical placements in these growth areas of practice have the potential to influence student career paths and may better equip graduates for the demands of the future workforce. These settings are increasingly delivering more complex care, due to rising client acuity, and have been shown to enabled students to develop comparable clinical competence to a hospital setting.

To the best of our knowledge student-assisted dietetics services have previously only been used for preparatory learning. This paper presents an evaluative case study of an innovative student-assisted dietetics service that provides 200 hours of supervised practice as part of an accredited Dietetics Education Program. The service is positioned within a Multidisciplinary Allied Health clinic that includes both private practitioners and student-assisted services. The dietetics service provides both outpatient and outreach services to long-term care facilities in rural and urban settings. The service uses a constructivist collaborative learning approach with two to three students running the clinic under the supervision of an experienced dietitian. Reflection is facilitated by discussions with their peers and supervisors using audio-visual recordings of clinical encounters.
Methods

Case study research has been used previously in health education research\textsuperscript{22,23} and allows holistic examination of a unique context using multiple sources of evidence.\textsuperscript{24} This pilot study examines the satisfaction of students and clients with the student-assisted dietetics service using two quantitative (Study 1 and 3) and one qualitative study (Study 2). Data was collected and reported independently and then considered together with the intention of providing a more comprehensive evaluation of the service. The [removed for blind peer review] Committee for Ethics in Human Research approved the study protocol (CEHR 11-98) that conforms to the provisions of the Declaration of Helsinki.

Study 1: Client Satisfaction with Service Provision in Outpatient Clinic

Study 1 was a quantitative study designed to determine if outpatient clients were satisfied with the quality of service provided by the student-assisted dietetic service. A retrospective audit of data was collected from 53 outpatient clients who received an initial dietetics consultation from the service (between October 2011-January 2012 and August 2012 to September 2012; corresponding with student placement times). Children under 18 years of age were excluded from the study. Before and after each consultation clients completed a modified version of the SERVQUAL questionnaire: a validated 22 paired item instrument\textsuperscript{25} that has been extensively used in health and patient satisfaction literature,\textsuperscript{26,27} and is modified to fit the characteristics of different health care settings.\textsuperscript{28} This version of the instrument measured service quality across six dimensions: perceived reliability (3 items); responsiveness (3 items); tangibles (3 items); empathy (4 items); assurance (7 items); and usability (3 items) using a seven point Likert scale. Both pre
and post versions of the SERVQUAL instrument were piloted in consultation with key stakeholders to achieve content validity. Data was entered and analyzed using Predictive Analytics Software (version 21; 2013; IBM). Pairwise exclusion of missing data was used. For each dimension, mean scores were calculated for each participant. Internal reliability was measured for each dimension using Cronbach’s alpha coefficient. SERVQUAL gaps scores, for each dimension and overall, were calculated by deducting the mean perception score from the mean expectation score.

**Study 2: Resident and Staff Satisfaction with Service Provision in Long-Term Care**

Study 2 was an interpretivist qualitative study that explored the experiences of residents and staff in receiving medical nutrition therapy provided by the student-assisted services. The study was conducted at two long-term care facilities: site one provided 60 high-level care beds and 40 low-level care beds; site two provided 55 high-level care beds, 35 low-level care beds and 35 retirement living villas. Focus groups were chosen for their amenability in exploring new endeavors and have been used in aged care services and with older persons. A convenience sample of residents and staff (including management, nursing, care and food service staff) were recruited through information sessions held at both facilities. Residents with cognitive impairment were excluded, as they were unable to fully comprehend the requirement of the study and therefore give informed consent. Separate focus groups were conducted for staff and residents, using a semi-structured interview schedule developed in consultation with key stakeholders and reviewed by experienced qualitative researchers. Interview questions explored nutritional issues experienced, the role of the dietitians and experiences with the students’ service.
Using snowball sampling the focus group data was triangulated with personal interviews to further explore the ideas raised in the focus group and to overcome methodological challenges associated with the aging process.\(^2\)

A research assistant facilitated the focus groups and personal interviews. All were audiotaped and annotated. In the focus groups a second research assistant was employed as a scribe. Recordings were transcribed verbatim by two research assistants and crosschecked for accuracy. Transcripts were analysed independently by the main researcher and three research assistants with themes highlighted using van Manen’s highlighting approach to thematic analysis.\(^3\) Themes arising from the interviews were compared to focus group themes and found to be similar enough to pool.

**Study 3: Student Dietitians’ Satisfaction with Student-Assisted Services**

Study 3 was a descriptive quantitative study that aimed to determine if students were satisfied with the quality of their supervised practice in the student-assisted service when compared to the hospital setting. Satisfaction data was collected by survey from a population of 15 final year Masters of Nutrition and Dietetics students completing their clinical rotation, as part of a Coordinated Program in Dietetics. All students completed a placement in the student-assisted service followed by a placement in the hospital setting. Students were invited to participate via a personal email that outlined the aims and benefits of the research and a link to an anonymous on-line survey. Students were invited to complete the survey twice, once for each setting. The survey was set up using

FEED OUR FUTURE: A pragmatist mixed methods exploration of Individual Case Management (ICM) placements outside the hospital setting.
Qualtrics Survey Software (version 12018, 2005, Qualtrics) and consisted of 37 items. Closed questions covered four categories: [learning environment (12 items), experiences (8 items), assessments (10 items) and supervision (10 items)] rated on a five point Likert scale. The survey also invited open-ended qualitative comments. This questionnaire was originally developed in 2007 by the first author for use in clinical and academic settings to improve the quality of their supervised practice. The instrument was based on the clinical education research presented by Rose & Best, revised by researchers with experience in clinical education and refined using preceptor consultation. Data was analysed using Predictive Analytics Software (version 21; 2013; IBM) and presented as medians for each items distinguishing between settings. The Wilcoxon Signed Rank Test was used to determine if there was a statistically significant difference, at the 95% confidence interval, between the student experiences in the UC Model clinic and the hospital setting across all items.

**Results**

**Study 1: Client Satisfaction with Service Provision in an Outpatient Clinic**

Study 1 achieved a response rate of 58% given 31 of a possible 53 clients completed SERVQUAL at both time points. The outpatient client demographics are presented in Table 4:1. Internal reliability was demonstrated with each of the six SERVQUAL dimensions using the Cronbach’s alpha coefficient ($\alpha > 0.7$) as presented in Table 4:2. The overall SERVQUAL scores (mean ± SD) for expectation and perception were 5.88±0.61 and 5.94±0.69 respectively with the highest possible score being 7. The GAP score was positive 0.18±0.67 indicating overall client satisfaction with the service.
Study 2: Resident and Staff Satisfaction with Service Provision in Long-Term Care

Study 2 recruited 19 residents (Site 1 n=11, Site 2 n= 8) and 14 staff (Site 1 n=10, Site 2 n=4) for the four focus groups and eight residents (Site 1 n=5, Site 2 n=3) for the personal interviews. There were three themes that emerged from the focus groups and personal interviews.

(1) Long-term care staff valued the dietetic service

[The service] made us realise there is a place for dietitians in aged care. They play a really important role in maintaining people’s weight and nutrition. They’ve been really good…They can pass knowledge on to us so that we can deal with residents well (Staff Focus Group, Facility 2, Participant #1).

They have increased communication in regards to nutrition between the girls in the kitchen and the girls that do the drinks and meals on the floor, and then with the rest of the staff. So that’s improved a great deal; everybody knows what each resident needs now (Staff Focus Group, Facility 2, Participant #5).

…there was a huge knowledge gap with [thickener], because people were tending to put the same amount of thickener in for every person rather than tailoring it to the consistency that is more relevant for that person (Staff Focus Group, Facility 2, Participant #2).
### Table A4:1 Study 1 Patient Demographics SERVQUAL Survey

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Categories</th>
<th>Participants No. (n=31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>21</td>
</tr>
<tr>
<td>Age</td>
<td>18-20</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>21-30</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>51-60</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>&gt;60</td>
<td>2</td>
</tr>
<tr>
<td>Employment status</td>
<td>Full time</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Part-time</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Casual</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Not employed</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Retired</td>
<td>2</td>
</tr>
<tr>
<td>Have previously seen a</td>
<td>Dietitian</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Student Dietitian</td>
<td>7</td>
</tr>
<tr>
<td>Referral source</td>
<td>University staff/student</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Family</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Internet</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Doctor’s referral</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>4</td>
</tr>
<tr>
<td>Reason for referral</td>
<td>Overweight / obesity</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Food allergy / intolerance</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Irritable bowel / gastrointestinal</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Cancer</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>General advice</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular disease</td>
<td>1</td>
</tr>
</tbody>
</table>
Table A4:2 SERVQUAL Results for 31 Ambulatory Clients using the SAS

<table>
<thead>
<tr>
<th>SERVQUAL Dimensions</th>
<th>Internal Reliability Cronbach’s</th>
<th>GAP Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E&lt;sup&gt;a&lt;/sup&gt;</td>
<td>P&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Reliability (3 items)</td>
<td>0.716</td>
<td>0.777</td>
</tr>
<tr>
<td>Responsiveness (3 items)</td>
<td>0.773</td>
<td>0.773</td>
</tr>
<tr>
<td>Tangibles (4 items)</td>
<td>0.826</td>
<td>0.886</td>
</tr>
<tr>
<td>Empathy (4 items)</td>
<td>0.909</td>
<td>0.939</td>
</tr>
<tr>
<td>Assurance (7 items)</td>
<td>0.910</td>
<td>0.895</td>
</tr>
<tr>
<td>Usability (3 items)</td>
<td>0.769</td>
<td>0.823</td>
</tr>
<tr>
<td>TOTAL</td>
<td>0.88±0.61</td>
<td>5.94±0.69</td>
</tr>
</tbody>
</table>

<sup>a</sup>E – Expectation; <sup>b</sup>P – Perception
(2) Long-term care residents prioritised food preferences over nutrition

We are old people and we should be given food that we like rather than health standards. That’s my honest opinion…We should be given some of the old fashioned…roast, potatoes in dripping. Cooked nice and crisp. It mightn’t be good for you …But as I say, satisfaction – I would like to have some of the old fashioned foods (Individual Interview, Facility 2, Participant #3)

(3) Dietetic interventions achieved positive health outcomes.

I was losing a lot of weight. I went down to 46kg. That is why I was put on Sustagen, I am gaining weight again which is good…Apparently, the report said I was well nourished.” (Individual Interview, Facility 2, Participant #2)

Overall the student-assisted dietetics service was well received with improvements in communication, knowledge and individualized dietetics care highlighted.

**Study 3 Student Dietitians’ Satisfaction with the Student-Assisted Services.**

In Study 3 six (6/15) students responded to the on-line survey about their experiences during their clinical rotation for the student-assisted services and five (5/15) in the hospital setting. The median rank scores for both settings are presented in Table 4:3. Item 16 (I had opportunity to work in a multidisciplinary team) was the only item where a statistically significant result was found between the two rotations (Wilcoxon Sign Rank Test, z = -0.577, p=0.034, r = 0.1). The medium score of this item increased from 3 (neutral) in the student-assisted services to 4 (agree) in the hospital setting although the effect size (r = 0.1) of the result was small (Cohen’s criteria).
The responses to the open-ended questions highlighted additional benefits of the student-assisted service, “It was a good opportunity for me to improve my management and organisational skills as the clinic is totally handled by the students.” (Student 1, Student-assisted service). And “This placement really helped me to build my counselling skills. This is something you do not get much of an opportunity to do if both clinical placements are undertaken in an acute hospital setting.” (Student 4, Student-Assisted Service).

The sample size achieved in Study 3 is small, may be influenced by respondent bias and should be interpreted with caution. Based on the data collected from the students who participated in the study the student-assisted service provided an equivalent supervised practice experience when compared to a hospital setting.
Table A4:3 A Comparison Between the SAS (n=6) & Hospital Placements (n=5)

<table>
<thead>
<tr>
<th>Placement Dimensions</th>
<th>SAS Md</th>
<th>H Md</th>
<th>z</th>
<th>AsympSig 2 tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning Environment (12 items)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I felt welcomed in the workplace</td>
<td>4.5</td>
<td>4.0</td>
<td>-1.134</td>
<td>0.257</td>
</tr>
<tr>
<td>I found the placement stressful (reverse score coded)</td>
<td>3.0</td>
<td>2.0</td>
<td>-0.272</td>
<td>0.785</td>
</tr>
<tr>
<td>I had appropriate work space and resources</td>
<td>4.0</td>
<td>4.0</td>
<td>-0.816</td>
<td>0.414</td>
</tr>
<tr>
<td>I received adequate orientation</td>
<td>4.0</td>
<td>4.0</td>
<td>-1.633</td>
<td>0.102</td>
</tr>
<tr>
<td>I received adequate information about my responsibilities</td>
<td>4.0</td>
<td>4.0</td>
<td>-0.816</td>
<td>0.414</td>
</tr>
<tr>
<td>I felt a valued part of the Dietetics team</td>
<td>4.0</td>
<td>4.0</td>
<td>-1.633</td>
<td>0.102</td>
</tr>
<tr>
<td>I felt prepared for the tasks expected of me</td>
<td>4.0</td>
<td>4.0</td>
<td>-1.633</td>
<td>0.102</td>
</tr>
<tr>
<td>I had adequate opportunity to develop my skills</td>
<td>4.0</td>
<td>4.0</td>
<td>-0.447</td>
<td>0.655</td>
</tr>
<tr>
<td>Collaboration with my peers assisted my learning</td>
<td>5.0</td>
<td>5.0</td>
<td>-0.447</td>
<td>0.655</td>
</tr>
<tr>
<td>The placement met my expectations</td>
<td>4.0</td>
<td>4.0</td>
<td>-0.447</td>
<td>0.655</td>
</tr>
<tr>
<td>I was given the appropriate amount of responsibility</td>
<td>4.0</td>
<td>4.0</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>If pursuing a career in clinical nutrition I would consider applying for a position at this placement site</td>
<td>4.5</td>
<td>4.0</td>
<td>-0.816</td>
<td>0.414</td>
</tr>
<tr>
<td><strong>Experiences (8 items)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The learning experiences included in my placement assisted me to meet my competencies</td>
<td>4.0</td>
<td>4.0</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
<tr>
<td>I was provided with a quality placement that provided a range of tasks and experiences and health conditions</td>
<td>4.0</td>
<td>4.0</td>
<td>-0.378</td>
<td>0.705</td>
</tr>
<tr>
<td>It demonstrated how theoretical knowledge can be applied in a practical situation</td>
<td>4.0</td>
<td>5.0</td>
<td>-0.378</td>
<td>0.705</td>
</tr>
<tr>
<td>I had opportunities to work in a multidisciplinary team</td>
<td>3.0</td>
<td>4.0</td>
<td>-0.577</td>
<td>0.034</td>
</tr>
<tr>
<td>It assisted me to develop clinical problem solving skills</td>
<td>4.5</td>
<td>5.0</td>
<td>-0.577</td>
<td>0.564</td>
</tr>
<tr>
<td>I was able to expand my thinking</td>
<td>4.0</td>
<td>5.0</td>
<td>-1.732</td>
<td>0.083</td>
</tr>
<tr>
<td>My understanding of clinical nutrition has improved</td>
<td>4.0</td>
<td>5.0</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
<tr>
<td>It inspired me to develop rapport and to empathize with the patient and for their family</td>
<td>5.0</td>
<td>5.0</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
<tr>
<td>Assessment (6 items)</td>
<td>Rating</td>
<td>Rating</td>
<td>SD</td>
<td>t-Value</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>Feedback on clinical and other work was helpful</td>
<td>4.5</td>
<td>4.0</td>
<td>-1.732</td>
<td>0.083</td>
</tr>
<tr>
<td>I received adequate feedback from my supervisor</td>
<td>4.0</td>
<td>4.0</td>
<td>-0.577</td>
<td>0.564</td>
</tr>
<tr>
<td>I was an active participant in my assessment and learning process</td>
<td>4.0</td>
<td>4.0</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>The criteria used for student assessment was made clear</td>
<td>4.0</td>
<td>3.5</td>
<td>-1.342</td>
<td>0.180</td>
</tr>
<tr>
<td>The assessment method was useful</td>
<td>3.0</td>
<td>3.5</td>
<td>0.535</td>
<td>0.593</td>
</tr>
<tr>
<td>My progress was critically and constructively monitored</td>
<td>4.0</td>
<td>4.0</td>
<td>-0.577</td>
<td>0.564</td>
</tr>
<tr>
<td>Supervisors (10 items)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Were good role models and set a good example for me to follow</td>
<td>4.5</td>
<td>4.0</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Provided adequate guidance and support throughout the placement</td>
<td>4.0</td>
<td>4.0</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Were knowledgeable in their work area</td>
<td>4.5</td>
<td>5.0</td>
<td>-0.517</td>
<td>0.564</td>
</tr>
<tr>
<td>Allowed adequate time for discussion with me</td>
<td>4.0</td>
<td>5.0</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
<tr>
<td>Had a professional attitude</td>
<td>5.0</td>
<td>5.0</td>
<td>-0.816</td>
<td>0.414</td>
</tr>
<tr>
<td>Were enthusiastic about teaching</td>
<td>5.0</td>
<td>5.0</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Took an interest in me</td>
<td>5.0</td>
<td>4.0</td>
<td>-0.378</td>
<td>0.705</td>
</tr>
<tr>
<td>Were helpful and approachable</td>
<td>5.0</td>
<td>4.0</td>
<td>-0.378</td>
<td>0.705</td>
</tr>
<tr>
<td>Facilitated my learning</td>
<td>5.0</td>
<td>4.0</td>
<td>-1.134</td>
<td>0.257</td>
</tr>
<tr>
<td>Were prepared for my placement</td>
<td>5.0</td>
<td>4.0</td>
<td>-1.342</td>
<td>0.180</td>
</tr>
</tbody>
</table>

*SAS – Student-Assisted Services; *H – Hospital
Discussion

This evaluative case study suggests that the student-assisted dietetics service was well received by the outpatient clients (Study 1), residents and staff at the long-term care facility (Study 2), and the students completing their supervised practice program (Study 3). The single case study design and small sample size of participant groups does not support generalised conclusions to be drawn from the findings of this pilot study. The findings however demonstrate the potential for innovative models of clinical education, in underserviced settings, to contribute to both workforce and internship shortages.

Implications for Dietetics Practice

The SERVQUAL instrument used in Study 1 resulted in a positive overall GAP score demonstrating acceptable service quality.\(^{25}\) The statistically significant results for the dimension Usability \((z=-2.026, p<0.05; \text{ with medium effect size } r=0.03)\) indicates that the clients found the service both practically and socially acceptable.\(^ {35}\) Similar results are reported by other studies demonstrating that health service quality is not compromised by student involvement.\(^{19,36}\) These finding should encourage dietitians to take on preceptor roles and involve students in their care delivery. Qualitative comments from Study 2 suggest that student-assisted services can also advocate for the dietetic profession by raising awareness of the role and benefits of employing dietitians in emerging areas of practice.

A paid group preceptor model was adapted to the primary health care settings using a
student-assisted approach to care. The model was able to significantly contribute towards the supervised practice requirements of an accredited dietetics program. In Study 3 all six students who participated in the student-assisted services felt it gave them a quality clinical rotation, with exposure to a range of tasks, experiences and health conditions (Item 14). Service quality is a key consideration in influencing referrals and usage and hence the sustainability of the student-assisted services. The referral-base and clinical experiences afforded to students in the student-assisted services was strengthened by including both outpatient and outreach services to long-term care settings.

More consideration needs to be given to the residents’ priorities and quality of life considerations in the long-term care settings. The findings from Study 2 highlight the need to review services provided to long term-care residents to ensure nutritional consideration are addressed together with food preferences. There is scope for the student-assisted service to broaden it scope and address food service management issues.

Interdisciplinary care has been highlighted as a benefit of university based clinics yet the results of the student satisfaction survey (Study 3) showed this was not their experience. This service is positioned within a multidisciplinary allied health service, however the data in this study indicates that co-location does not constitute interdisciplinarity. University timetabling, budget and space have been presented as barriers to interprofessional practice in universities clinics. Further efforts will needed to foster interprofessional education in these settings.
Implications for Dietetics Research

There is some evidence suggesting that customer satisfaction is associated with improved compliance and better health outcomes.\textsuperscript{19, 40} In Study 2 the qualitative comments suggest that positive health outcome were achieved by the interventions from the student-led service. Evidence is required to confirm these findings and to evaluate the effect student-assisted services can have on health outcomes in underserviced settings.

Future research is required to determine graduate outcomes from this model. Using a range of clinical settings to develop competence in the application of medical nutrition therapy should develop a more flexible workforce as students are required to demonstrate their capacity to reflect, develop new knowledge, and to transfer competency to new contexts.\textsuperscript{41} A traditional didactic approach to supervision is likely to perpetuate current practices however using a constructivist approach in underservices settings has the potential to extend professional boundaries. Evidence is required to confirm if graduates who participate in this model demonstrate creativity or innovation in their approach to practice. The student-satisfaction survey (Study 3) highlighted additional benefits with the student-assisted model in terms of the development of nutrition counselling, business and management competencies. Evidence is required to determine if these graduates are better equipped for the future workforce.
Conclusion

This research presents a case study of student-assisted services as an innovative approach to clinical education within a Dietitian Education Program. This context specific study demonstrated consumer satisfaction with the model. This research has implications for addressing workforce shortages in underserviced settings, increasing the supervised practice opportunities needed for dietetics credentialing, and preparing graduates for the future.
References


Appendix 5 Revised Individual Case Management Clinical Placement Milestones

The following skills outline a progression from basic nutrition and dietetics theoretical knowledge to becoming a competent practitioner in clinical dietetics when students progress form a placement in a community setting to a placement in a hospital context. The time frames are an indication only.

Weeks 1-2 of the Placement

Themes: Orientation, Data Collection and Communication Skills.

At this stage of placement you will need orientation and education. You will need constant briefing and debriefing for most contact with clients. By the end of week 2 you should be able to conduct the data collection phase of the consultation with some assistance. You may need to focus on your rapport development.

Learning Outcomes - By the end of week 2 you will be able to:

(1) Participate in the clinical placement program, the dietetics department and clinical facility

(2) Use nutrition screening to inform your referrals and conduct the data collection phase of the consultation with some assistance from your supervisor

(3) Demonstrate reflective practice and professionalism

Your learning objectives are to:
(1) Participate in the clinical placement program recognising the structure, roles and expectations within the clinical facility

(1) Navigate the dietetics department relevant work areas or hospital wards being orientated to relevant policies, documents, business rules, staff and resources

(2) Use the facilities communication systems such as client booking programs, food service systems, paging etc

(3) Liaise appropriately with the food service department

(4) Understand the role of various administration, care staff, nursing, medical staff, allied health and nutrition support staff with the facility and relevant services within the community

(5) Develop an understanding of nutrition screening and referral processes

(6) Collect relevant assessment data from a resident’s/client’s file with assistance

(7) Demonstrate familiarity with medical terminology and medications

(8) Conduct the introductory phase of a nutrition consultation including:

   a. Introduce yourself and facilitator to a client/resident;

   b. Clarify the reasons for referral in consultation with the client;

   c. Provide an overview of the consultation.
(9) Use questions appropriately to clarify or collect relevant background information (client history, medical history, medication, social history, anthropometry, biochemistry, clinical, food and nutrition related history) from the clients or care staff with some assistance from your supervisor.

(10) Use the most appropriate method to collect dietary information (i.e. food diary, diet history, 24hr recall, food intake chart, fluid balance chart, pre-morbidity, in-hospital etc.)

(11) Familiarise yourself with anthropometric equipment used for data collection and /or processes to obtain / request assessment data (weights, biochemistry, food intake charts etc)

(12) Use malnutrition assessment tools such as the PGSGA or SGA to inform your assessment with some assistance from your supervisor.

(13) Brainstorm data interpretation, nutritional diagnosis, nutritional interventions, monitoring and evaluations with supervisors.

(14) Observe the assessment, education and counselling of clients and follow-up arrangements made by dietitians.

(15) Document in the client / residents' file with support from your supervisor.

(16) Brief and debrief with your supervisor continuously throughout the day.
Weeks 3-4 of the Placement

Themes: Data Interpretation and Interventions

By this stage you should be able to conduct the data collection phase of the nutrition consultation with a client with supervision and minimal assistance. After the first phase of the consultation it is appropriate to brainstorm with your supervisor your data interpretation and nutritional diagnosis. With supervision you should be able to deliver the education and counselling phase of the consultation for simple cases.

Learning Outcomes - By the end of week 4 you will be able to:

(1) Independently conduct the data collection phase of the nutrition consultation, compare your assessment data to relevant standards and use this to interpret your assessment data

(2) Determine an appropriate nutritional diagnosis/es in consultation with your supervisor

(3) Plan and implement the nutrition intervention phase of the consultation including dietary prescription, nutrition education, counselling and coordination of care for simple cases with some assistance from your supervisor

(4) Demonstrate reflective practice and professionalism
Your learning objectives are to:

(1) Independently complete the introductory and data collection phases of the nutrition consultation

(2) Target the dietary history data collection based on priority of nutrients assessed, cognitive capacity of the client and medical/surgical history

(3) Assess the diet history qualitatively ‘on the spot’ during a nutrition consultation

(4) Quantitatively assess a client’s / resident’s food intake chart / diet history using the Australian Guide to Healthy Eating, a ready reckoner, dietary analysis app or program as appropriate

(5) Compare assessment data against recognised standards and brainstorm data interpretation and nutritional diagnosis/es (PESS statement/s) in consultation with supervisor

(6) Communicate the nutritional assessment to the client

(7) Provide relevant diet disease relationship/s using appropriate language and visual aids with minimal assistance for simple cases*

(8) Negotiate appropriate dietary goals in consultation with client for simple cases.*

(9) Selects appropriate resources and provides dietary education with minimal assistance for simple cases*

(10) Identify clients’ stage of change and as appropriate uses behavioural change strategies to address motivation for change or increase clients’ confidence to overcome barriers to change (such as goal setting, social support, self monitoring / food-mood diary, meal plan, stimulus...
control or problem solving) with some assistance from your supervisor

(11) Identify appropriate referrals to other health professionals / community services, with some assistance from your supervisor

(12) Briefs and debriefs with your supervisor before, during (as appropriate) and after each nutrition consultation.

(13) Document in the client‘s/ resident‘s file with some assistance from your supervisor

(14) Can present a simple case study incorporating all facets of nutrition assessment and care including social, psychological, medical/surgical, cultural and behavioural components

* Supervisor support is expected for cases with some degree of complexity

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**Week 5 of the Placement**

**Themes: Nutritional Assessment and Monitoring, Managing Simple Cases Independently**

At this stage you should be able to conduct the whole consultation for simple cases without assistance. You may require some assistance during the consultation to confirm your interpretation of assessment data and your nutritional diagnosis. You should be able to justify reasons for your clinical decisions. You should be increasing in confidence and efficiency in your documentation.
Learning Outcomes - By the end of week 5 you will be able to:

(1) Complete the nutritional care process for simple cases with minimal assistance

(2) Use nutrition counselling strategies to support behavioural change

(3) Present nutritional diagnosis and clinically reasoning to your supervisor for confirmation

(4) Develop appropriate timelines and indicators for monitoring and evaluation with some assistance

(5) Demonstrate reflective practice and professionalism

Your learning objectives are to:

(1) Independently elicit all necessary assessment data from appropriate sources (e.g. client notes, clinical charts/records, carers, health professionals and client.)*

(2) Perform assessment, education and counselling for simple cases with some supervision without assistance*

(3) Effectively communicate with clients using appropriate language*

a. Respond to verbal and non-verbal cues expressed by client/resident and their carers;

b. Evaluate client knowledge during education or counselling session;

c. Evaluate client’s current stage of change and adapt session appropriately;

d. Encourage the client’s participation in the education process (interactive education);
e. Be flexible and able to incorporate individual needs of a client into nutritional advice provided.

(4) Implement dietary interventions with minimal prompting*

(5) Educate in a small group setting

(6) Liaise with other members of the multidisciplinary team without prompting

(7) Document in the client’s/resident’s file with minimal assistance including appropriate PESS statements

*Supervisor support is expected for more complex cases

Weeks 6-7 of the Placement

Themes: Orientation; Transfer of the Nutrition Care Process to a New Context

It is expected that during weeks 6-7 your progress may appear to go backwards. It will take you some time to transfer your understanding of the Nutrition Care Process to a new context. You may require some support from your supervisors as you learn the new processes. In the hospital setting you should focus on achieving efficiency with reading medical records, medication/clinical charts and interpreting biochemistry. You should also focus on developing your communication skills with other health professionals within the multidisciplinary team.
Learning Outcomes - By the end of week 7 you will be able to:

(1) Participate in the clinical placement program, the dietetics department and clinical facility in a new setting

(2) Identify and address any gaps in data collection and interpretation and communication skills evident in the new setting

(3) (After an appropriate nutritional diagnosis/es has been determined in consultation with your supervisor) identify and address any gaps in the planning and implementation of an appropriate nutrition intervention including dietary prescription, nutrition education/counselling and coordination of care in the new clinical setting

(4) Demonstrate reflective practice and professionalism

Your learning objectives are to:

(1) Participate in the clinical placement program recognising the structure, roles and expectations within the clinical placement facility

(2) Complete orientation to the placement program, structure, roles and expectations within the new clinical placement facility

(3) Navigate the dietetics department, relevant work areas or hospital wards being orientated to relevant policies, documents, business, staff and resources

(4) Use communication systems such as paging, food service management system etc
(5) Develop an understanding of the interaction between Dietitians and the Food Service System in the hospital setting

(6) Develop an understanding of the roles of various Allied Health, Nursing and Medical staff and nutrition support staff within the hospital

(7) Be able to use referral pathways both to and from the dietetics service

(8) Review prioritisation processes for a caseload within the hospital setting and prioritise a small caseload in consultation with your supervisor

(9) Demonstrate familiarity with medical terminology and medication

(10) Access and understand relevant biochemistry results (with discussion and prompting)

(11) Read and understand medical notes and clinical charts, some assistance may be required initially

(12) Familiarise yourself with anthropometric equipment used for data collection and/or processes to obtain / request assessment data (weights, biochemistry, food intake charts etc.).

(13) Observe your supervisor completing the nutrition care process to gain an understanding of their expectation of performance, including malnutrition assessment tools used in the hospital facility

(14) Gain experience with providing special diets in particular enteral feeding / TPN

(15) Begin discharge planning from the initial consultation

(16) Review documentation expectations within the new hospital setting
(17) Begin conducting full consultations with the support from your supervisor. Expect your efficiency to be reduced as you adjust to your new placement setting.

(18) Brief and debrief with your supervisor continuously throughout the day.

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**Week 8-9 of the Placement**

**Themes: Nutritional Assessment and Monitoring, Managing Simple Cases Independently**

At this stage of the placement you should be able to provide a nutrition care plan with minimal assistance for simple cases in the new hospital context. For more complex cases you will require some assistance from your supervisor. The main focus of these two weeks is to improve your efficiency with the nutrition care process in the hospital context. You should still brief and debrief regularly with your supervisor throughout the day.

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**Learning Outcomes - By the end of week 9 you will be able to:**

1. Collect assessment data with minimal assistance for simple cases
2. Present nutritional diagnosis and clinical reasoning to supervisor for discussion
3. Develop appropriate nutrition intervention including enteral feeding / TPN cases
4. Develop appropriate timelines and indicators for monitoring and evaluation
5. Demonstrate reflective practice and professionalism
Your learning objectives are to:

(1) Take a quality referral from nursing or allied health staff obtaining key important patient specific details

(2) Prioritise a caseload with minimal assistance

(3) Independently elicits all necessary assessment data from appropriate sources (e.g. client notes, clinical charts/records, carers, health professionals and client.)*

(4) Present justifiable conclusions to supervisors regarding dietetics care

(5) Develop and implement appropriate goals, feeding regimes, diets and supplements, education, referrals and discharge plans

(6) Communicate effectively with client, carers, nutrition support staff and other health professionals, participating in ward meetings and case conferencing as appropriate

(7) Document in medical notes with minimal assistance

Week 10 of the Placement

Themes: Case-load Management

By week 10 you should be able to manage a new graduate clinical area without supervision, with some occasional assistance. You should debrief with your Supervisor daily.
Learning Outcomes - By the end of week 9 you will be able to:

(1) Demonstrate the nutrition care process independently for simple cases and seek appropriate assistance for more complex cases

(2) Manages 75% of a new graduate workload

(3) Demonstrate reflective practice and professionalism

(4) Achieves entry-level competence against the dietetic practice clinical competencies

Your learning objectives are to:

(1) Take a quality referral from medical, nursing or allied health staff obtaining key important patient specific details

(2) Prioritise and manage a simple ward load, ensuring all patients are seen in a timely manner

(3) Perform entire nutrition assessment, including data collection from medical notes and individuals, on simple cases without direct supervision

(4) Devise and implement intervention for patient care without assistance

(5) Perform education and counselling sessions independently

(6) Respond to patient’s non-verbal cues

(7) Assess patient’s stage of change
(8) Evaluate patient’s comprehension of information discussed

(9) Debrief regularly with Supervisor

(10) Reflect on current progress, identifying areas for improvement

(11) Research clinical areas and specific nutritional questions to provide evidence based nutritional care at all times

Even at this stage of placement you may need guidance and advice on complex cases
Appendix 6 - A Web-Based Program to Prepare Students for their Hospital ICM placement.

**Figure A6.1A Program Interface – Home Page**

**Preparation for Hospital (Online Module for 8661)**

**e-Learning for Student Dietitians**

*This program is designed to support you in your preparation of your individual case management clinical placement in a hospital setting. The program has been informed by feedback from supervisors, academics and students.*

- **Announcements**
  - Something to consider and a bit of fun :)
  - Open the Student Dietitians Clinical Placement 2015 Moodle Site Here

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Translations</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.c.</td>
<td>before meals</td>
</tr>
<tr>
<td>b.i.d.</td>
<td>twice daily</td>
</tr>
<tr>
<td>caps.</td>
<td>capsule</td>
</tr>
<tr>
<td>h.s.</td>
<td>at bedtime</td>
</tr>
<tr>
<td>ung.</td>
<td>ointment</td>
</tr>
</tbody>
</table>

**Medications**

**Biochemistry**

**Medical Records**

**Practice Cases**
Figure A6.1B Program Interface – Module 1

Abbreviations

You should allow 60 minutes to complete this module.

Learning Outcome:

On completion of this unit you will:
(1) Demonstrate familiarity with common medical abbreviations used in the hospital setting;

Learning Activities:

Step 1 - Spend some time reviewing the attached document that contains common medical abbreviations.

Step 2 - WITHOUT referring to the above document complete the quiz below. You can complete this quiz as many times as you like but you must get 100% before you can move on to the next Module. You are allowed 15 minutes to complete the quiz.

- Common Medical Abbreviations
- Medical Abbreviation Quiz
4  Figure A6.1C – Program Interface – Module 2

Medications

You should allow 90 minutes for this module.

Learning Objective:

On completion of this unit you will:

1. Demonstrate familiarity with common medications used in a hospital setting that may influence your dietetic interventions;

Learning Activities:

Step 1: FIRST use your clinical notes and this website, MIMS online or a Medications App. to complete the common medications worksheet table found in the Word document attached below.

Step 2: Check your knowledge by completing the online quiz below. You can complete this quiz as many times as you like but you must get 100% before you can move on to the next Module. You are allowed 10 minutes to complete this quiz.

Worksheets - Common Medications

Medication Quiz

Useful resources

If you are a member of Practice-based Evidence in Nutrition (PEN) you may also like to look at these resources.
6  Figure A6.1D - Program Interface – Module 3

Biochemistry

You should allow 60 minutes for this module.

Learning Objective:

On completion of this unit you will:

1) Demonstrate your ability to interpret biochemistry results as a part of the nutrition care process.

Learning Experiences:

Step 1 - Review your clinical notes and pages 34-44 of the attached document to improve your ability to interpret biochemistry results.

Step 2 - WITHOUT referring to the above material complete the online quiz below. You can completed this quiz as many times as you like but you must get 100% before you can move on to the next Module. You are allowed 10 minutes to complete this quiz.

Interpreting Biochemistry

Pages 34-44 of this document are very helpful to assist you in interpreting pathology results.

Biochemistry Quiz
8 Figure A6.1 E - Program Interface – Module 4

Medical Records

You should allow 60 minutes for this module.

Learning Objective:

On completion of this part you will:

1. Efficiently extract and interpret relevant assessment data from medical records and charts;
2. Document nutrition care plans appropriately using ADIME format

Learning Activities:

Step 1 - Read through the attached medical record collecting all relevant information. Note any missing information that you would need to collect and where you could source this information from. You are only allowed 15 minutes to complete this task.

Step 2 - Open the file "Additional Information" and complete an ADIME entry for this case using the Assessment Form provided. Upload your entry to the Assignment Drop Box. You are allowed 30 minutes to complete this task.

Step 3 - Compare your entry to the exemplar provided. Write a reflection on how your entry could have been improved. Upload your reflection to Moodle using the Assignment Drop Box provided.

De-identified Medical Record Case 1
Additional Information
Assessment Form

Use this assessment form to complete your first ADIME entry. This is usual practice in many hospitals.

ADIME entry 1
ADIME exemplar
Reflection ADIME entry 1
Practice Cases

You should allow 2 hours for this module.

These cases are provided to give you a chance to consolidate your practice. Repeat the same steps as for Unit 4 for each of the following cases.

CASE 2
- De-identified Medical Record Case 2
- Additional Information Case 2
- ADIME entry 2
- ADIME exemplar 2
- Reflection ADIME entry 2

CASE 3
- De-identified Medical Record Case 3
- Additional Information Case 3
- ADIME entry 3
- ADIME exemplar 3
- Reflection ADIME entry 3