An Australian story: Paramedic education and practice in transition

Kylie O'Brien PhD¹, Amber Moore BChinMed(Hons)^{1,2}, David Dawson MBA³, Peter Hartley PhD³

Affiliations:

¹ Australian Institute of Applied Sciences, Melbourne, Australia

² Department of Medicine, Monash University, Melbourne, Australia

³ Victoria University, Melbourne, Australia

SUMMARY

In Australia, western medicine and the majority of allied healthcare professions are regulated via statutory regulation. For most of these allied healthcare professions, education has moved into the higher education (HE) sector and universities. The profession of paramedics is undergoing a transition in terms of scope of practice, and in particular education, moving from a post-employment model characterised by on-the-job training, to a pre-employment model, essentially full time university-based Bachelor degree education, similar to the change that occurred in nursing in Australia many years ago. How to produce work-ready graduates in the healthcare professions is of concern for educators and professional associations. Research into work-readiness in several healthcare fields has yielded important information that may be utilised by paramedic and other allied healthcare educators to improve courses. This paper discusses issues of transition of HE healthcare graduates into the workforce that need to be considered by educators, with a particular focus on the profession of paramedics in Australia. It also summarises key findings of research into work-readiness in a range of healthcare professions.

Keywords

Education, paramedics, transition, work readiness

Corresponding Author: Kylie O'Brien, kylie-obrien@aias.com.au

INTRODUCTION

In Australia, the majority of mainstream healthcare professions are regulated via statutory regulation. In contrast, some other forms of allied health such as paramedics, and most forms of complementary and alternative medicine (CAM), except Chinese medicine, are self-regulated via professional associations. Education of many healthcare disciplines has undergone change over the past 30-40 years, with a move predominantly into universities within Australia. Until a few decades ago, for several mainstream healthcare disciplines, training was originally hospital-based, industry-based or in privately operated institutions. For example, nursing education began to transfer from hospital-based training into universities in the late 1970s and 1980s, with bachelor degrees finally being offered in the 1990s, though there were attempts to introduce nursing training into Australian universities as early as the 1930s. Chiropractic training moved into universities in

Australia in 1980, resulting in the demise of most of the 13 chiropractic colleges in existence (1). Osteopathy training moved into the HE sector in 1986 at Phillip Institute (later to merge with the Royal Melbourne Institute of Technology which achieved university status in 1994) with the first publically funded undergraduate course in Melbourne (2). Western medicine has been offered in Australian universities since the second half of the nineteenth century (3). Statutory regulation has preceded the move into the higher education system in many professions such as nursing and osteopathy, however, in the case of a newcomer to the national regulatory scheme, Chinese medicine, it has been the reverse of this process. The move of education into universities and HE sector contributes to the legitimisation, maturing and as a consequence, 'mainstreaming' of a profession.

With the transition of health profession education into the higher education (HE) system come several advantages, but also challenges. For example, how well do university courses train students in the practical skills needed in a profession? How well prepared are graduates to enter the health workforce? What is 'work readiness' fundamentally anyway? These are matters of concern for educators and the professions more broadly. The issue of transition of graduates into their first year of work has received some attention in several healthcare professions, in particular medicine, nursing and more recently, Chinese medicine (4-9). This paper will discuss the issues of transition of HE healthcare graduates into the workforce that need to be considered by educators, with a focus on changes occurring in one profession yet to become regulated via statutory regulation in Australia: paramedics. This profession is of particular interest as paramedic education is currently undergoing a similar transition that has previously been experienced by nursing: transitioning from a post-employment model (on-the-job training) to a pre-employment model whereby education is conducted in universities as bachelor degree programs. Attention will be given to research findings relating to transition into the workforce for several healthcare disciplines and conclude with some recommendations for educators. As background, the Australian practitioner regulatory context of healthcare professions and the relationship to education will be given.

The Healthcare Practitioner Regulatory Context and its Relationship to Education

In 2009, the *Health Practitioner Regulation National Law Act 2009* was passed, bringing all professions previously regulated under state and territory legislation under the one National Registration and Accreditation Scheme, and adding a few newcomers such as Chinese medicine. Each profession has their own board, and the Australian Health Practitioners Regulation Agency (AHPRA) is the coordinating body (<http://www.ahpra.gov.au/>). Health practitioner boards have the power to approve courses of study that lead to registration of graduates, typically setting out detailed guidelines for courses that need to be adhered to. A potential consequence of this is the homogenisation of courses as courses strive to ensure they meet Board course approval guidelines, and of course, increased costs associated with the approval process.

An advantage of delivery of healthcare courses by universities, and of statutory regulation and

course approval by a (statutory) health practitioner Board, is their contributions to the legitimisation of a profession. In the case of Chinese medicine, the move of education into universities, for example, provided a platform from which the profession was able to argue the case for statutory regulation (initially at the state level in Victoria). Achievement of this then contributed to its further legitimisation, and eventually its inclusion in the National Registration and Accreditation Scheme. Its position within universities has also enabled greater opportunities for scientific research into Chinese medicine, again contributing to its legitimisation.

Paramedics are unusual in being one of the mainstream professions not regulated under the national scheme, instead being self-accredited. Paramedics have gained authority to act (as a paramedic) by being employed by an ambulance service. In turn, the ambulance service is established by an Act of Parliament (see the *Ambulance Services Act [Victoria] 1986* (10) and the *Ambulance Services (Amendment) Bill 1998* (11). It is not inconceivable that in the future paramedics may be considered for inclusion under the national regulatory scheme. As such, the experiences of other healthcare professions in moving into HE institutions and becoming regulated via statutory regulation may be relevant to this profession.

Paramedic Practice: Changing Scope and Education

There has been a significant shift in the scope of practice of paramedics in Australia, from little more than a transporter of persons to hospital, to provision of emergency and non-emergency out of hospital and pre-hospital care and transport of sick and/or injured persons (12). Services include inter-hospital transport, specialised rescue services, responding to multi-casualty occurrences and capacity-building for emergencies (13). Paramedics now provide advanced and invasive medical techniques such as rapid sequence intubation and pre-hospital thrombolysis (13,14). Many rural and remote areas have difficulty attracting and retaining healthcare professionals, and so paramedics often take on healthcare services normally carried out by other health disciplines in these remote locations. The Australian Council of Ambulance Authorities (CAA) reports that several ambulance services are exploring the expansion of the role of paramedics into primary healthcare provision and strengthening community healthcare collaborations in rural and remote areas (12).

Paramedic education has by necessity changed. Originally educational requirements were minimal

(eg. only needing first aid training), then as the role of the paramedic began to extend, the next phase was (exclusively) in-house training (the 'post-employment' model) provided by state and territory-based ambulance service providers. In the current post-employment model, students are employed as student paramedics, complete on the job training with block release for classes (undertaken in the vocational education (VE) sector), then graduate with the paramedic qualification (usually at diploma level) with continuing employment¹⁴. More recently, there has been a transition towards a *pre-employment* model of training; university bachelor degree courses (15), as has occurred in other healthcare professions previously. Students complete a three-year bachelor degree program, apply for an advertised graduate paramedic job and complete an internship of 1-2 years (16).

The CAA heavily influences paramedic education, having established an accreditation process for tertiary entry-level paramedic programs to ensure that graduates from these programs have achieved the requisite competencies required for employment with an Australasian ambulance service as an entry-level ambulance paramedic (17). The CAA itself is comprised of employers (employing agencies) that accredit paramedic HE courses with industry and education representation on these accrediting panels, though the authority to practice is still governed by the individual employing services. Paramedic service provision is state and territory-based in Australia, with the six states and two territories each having a single service response. 'Ambulance Victoria', the state-based ambulance authority and major employer of paramedics in Victoria, requires that paramedics have a minimum of bachelor degree training in paramedics. Thus education in Victoria is bachelor degree level training within (five) universities. South Australia and Western Australia have discontinued all 'in-house' paramedic programs and moved to HE courses (12), whilst the other four states and territories still have a mixture of post-employment and pre-employment training models. The trend suggests that the pre-employment model (i.e. tertiary education training) will become the sole entry point into the paramedic profession in the not-too-distant future (14). A total of twelve universities in Australia offer paramedic programs at bachelor degree level.

The paramedic profession is self-regulated, as previously mentioned. As has occurred in other professions in Australia, there is more than one professional association representing paramedic professionals. The two key industry bodies in this respect are the CAA and the Paramedics Australasia. They have both produced national

competency standards for paramedics. Only the CAA currently provides accreditation of entry-level HE education courses, a process it began relatively recently. At a 2004 paramedic education symposium, it was clear that the industry supported a process of evaluation of paramedic education programs to ensure appropriate standards were achieved and there was consistency across programs in terms of course content and training outcomes. The CAA 'Guidelines for the Assessment and Accreditation of Entry Level Paramedic Education Programs' were developed and trialled out in several education providers in 2007 resulting in several HE courses gaining provisional accreditation. The guidelines were subsequently refined following this process¹⁶. It is also only relatively recently that the CAA published national competency standards ('Paramedic Professional Competency Standards') (18). This new external course approval process has therefore added a further layer of quality assurance (QA) reporting on top of internal institutional QA processes to education providers, but an advantage is that this process provides important benchmarking for individual institutions.

For the profession more broadly a national course approval/accreditation process can be seen as further evidence of the increasing legitimization of this profession. It is worth noting that the CAA's paramedic course accreditation guidelines are comprehensive, but in the opinion of the authors are not overly prescriptive in comparison to some course approval guidelines in healthcare professions that are regulated via statutory regulation. As stated in their guidelines, '*Accreditation is not about standardisation of paramedic education programs. Rather both the industry and the profession believe that variation in education programs is important and that education programs must be responsive to the needs to the industry, the profession and communities, including type of practice and workforce needs*' (16). However, as previously mentioned, there are two different sets of national competencies developed by two separate authorities, the CAA and Paramedics Australasia. If Paramedics Australasia also begin the process of accrediting courses, this may lead to confusion within the paramedic education ranks. However, this is not unlike what has occurred in other professions such as Chinese medicine where there are two major professional associations representing Chinese medicine practitioners in Australia, each with their own course approval processes (allowing graduates from approved courses to be eligible for membership of these associations). Historically, Chinese medicine education providers have either applied to one or both associations for course approval.

Whilst there has been significant movement with respect to undergraduate training, some states and territories have developed postgraduate programs to ensure paramedics have the skills needed to provide the healthcare services necessary for particular communities. For example, James Cook University in collaboration with the Queensland Ambulance Service and Queensland Health developed the first Graduate Certificate in Rural and Remote Paramedic Practice for Paramedics (12). This program provides paramedics with advanced clinical skills to be able to provide integrated health services in conjunction with other health professionals and therefore enable extended access to health service delivery in rural and remote areas of Australia. The Ambulance Service of New South Wales piloted an Extended Care Paramedic program that skills paramedics in the assessment and identification, planning and initiating of alternative non-emergency department care. In addition to their regular roles, Extended Care Paramedics provide low acuity patients with referral advice to alternative healthcare services where appropriate, rather than transporting them to the emergency department when this is not necessary (12). Health Workforce Australia (HWA) has recently announced a major project investigating the extending role of paramedics aimed at reducing emergency department (ED) presentations.

Graduating Work Ready Healthcare Professionals

Higher education providers in Australia are increasingly questioning educational training needs of graduates and how to best prepare graduates for the healthcare workforce. Graduates need to be skilled not only to work in the Australian healthcare context, but also internationally. 'Internationalisation of the curricula', for example, refers to internationalisation of the content of courses and the learning and teaching approaches/strategies (19). With the increasing professionalization of healthcare providers, more research is being undertaken in this area of education and the transition to practice.

The transition from final year of training into the workforce is a critical time. In the United States (US), *'approximately 50 to 80 percent of new college graduates leave their first job within the first three years'* (20). There are several possible reasons including the difference in corporate culture compared with college culture, cognitive development, 'successful' and 'emotional' intelligence and competencies, workplace preparedness, psychosocial development, learning issues, motivational issues, interpersonal

and group skills, career planning and skills for independent living (20). The issue of preparedness to enter the workforce has been investigated in several healthcare disciplines in Australia including medicine (6,7), dentistry (21), nursing (8), Chinese medicine (9), physiotherapy (22), occupational therapy (23) and paramedics. Table 1 sets out the key findings of these Australian studies. A number of issues are present in the investigation of health care graduates' work-readiness and the transition to practice. Students' expectations may affect their initial encounters with the workplace (24,25), and their self-assessment of preparedness, clinical competence, and confidence may change over time (23). The increasing complexity of healthcare practice and differences between objectives of key stakeholders such as managers, funders, regulators, educators and patients, can force significant competing demands on new practitioners, which can be stressful (26). The expectations of employers and professional bodies may not yet be commensurate with those of regulators and educational institutions (27,28).

Findings that students experience a significant change in learning environments when they enter the workplace support the growing focus on the development and provision of education that more closely reflects the clinical setting (29,30). Research in various healthcare fields has clearly demonstrated the value of clinical practical experience in preparing students for entering the workforce (26,31-35). The importance of clinical training experiences to perceptions of preparedness for practice is a common theme in the Australian studies in Table 1.

Variety of clinical experiences is also important. For example, research in medicine has demonstrated the value of a variety of clinical placements including in rural communities in preparing graduates for their internship experiences (31). Surveys of two cohorts of medical graduates on retrospective self-perceptions of readiness for clinical practice found that significant differences between cohorts could be explained by undergraduate curriculum design (26). They concluded that early, structured work-based experiential learning with patient contact central to the experience may promote a more effective transition into the workforce (26). The type of clinical learning environment may also influence the perceived development of competencies and preparedness for clinical practice (36). The implications of this research derived from more established fields for educators within developing healthcare professions may include consideration of greater embedding of the formal curriculum (including assessment) within the professional practice setting. This may be especially important for university educators of

paramedics as the field transitions from the field to tertiary education institutions. This is also of relevance to paramedic professional associations as key features of a profession are argued to include the education of a body of theory that is linked to practice, and an accreditation process that is determined by the wider profession (37). Thus, in developing and conducting their course accreditation processes, professional associations must also pay attention to what educational research is discovering with respect to helping students become work ready graduates.

Kilminster and colleague's research into the transition of first year medical interns and specialist trainee doctors challenges the notions of what constitutes preparedness (38). Their research suggests that performance of doctors is situational and relational, occurring in the interface between the individual and the work itself in a particular setting, and is not a set of skills or a personal attribute. They suggest that there are two problems with the notion of preparedness. The first is that preparedness depends on the notion of transfer of learning (from medical school and other settings) into a particular practice setting when there is no evidence in the literature that this occurs. Consequently, the theoretical underpinning should be that learning is situated and thus requires authentic practice within a community. The second problem they identify is that ideas about preparedness isolate individuals from the contexts, practices and social relationships within which they learn, when, they argue, their research demonstrates otherwise. Whilst they acknowledge that an individual's pre-existing knowledge and skills are important, it represents only 'a part of what he or she needs in order to perform effectively as a new professional or in a new setting' (38), and that a doctor's performance is affected particularly by organisational practices, activity and culture. Their findings indicate that practice, performance and learning are inseparably interlinked and dependent on the specific setting, and they argue that doctors can't be fully prepared for transition. They also argue that any transition (such as working as a first year intern) should be recognised as a 'critically intensive learning period' and that the extent to which institutional learning cultures take this into account will contribute to how new doctors perform (38).

How individual healthcare professions tackle the issue of transition of graduates into the workforce is likely to vary. One recommendation repeated in the literature is for universities to work together with professional bodies, employers and students in order to develop effective learning environments and support the transition from student to working professional (24,39,40). The development of professional praxis can be seen

as a continuum from student to practitioner, as professional behaviours and identity begins during education and evolves over one's professional life⁴¹. In Australia and overseas other formal transition support programs have been conducted in medicine (42,43), nursing (44-47), and occupational therapy (48,49). These programs all report successful outcomes but vary in design and assessment. Programs such as The Royal Australasian College of Physicians' Physician Readiness for Expert Practice (PREP) program (details of which can be found at <http://www.racp.edu.au/page/educational-and-professional-development/prep-basic-training>) are rigorous in terms of participation and assessment requirements, whereas programs such as the Occupational Therapy Australia's mentoring program are more flexible and less structured (<http://www.mentorlinklounge.com/>). In contrast, in the field of Chinese medicine (a recently regulated health profession) in which the majority of practitioners practice in private practice as solo practitioners, the main forms of support for graduates are membership of a professional association and development of informal mentoring relationships. Research into the perceptions of preparedness for clinical practice in final year Chinese medicine students (9) and a follow-up survey of recent graduates in Australia (40) identified a desire for formalised mentoring programs to assist transition into the workforce. The need to support students in the important transition phase in these and other fields of healthcare is being increasingly recognised.

Challenges for Educators in the Field of Paramedics

Returning once again to the field of paramedics, whilst there is general agreement within the industry that paramedic graduates need to be 'work-ready', there are differences in how this term is defined and therefore expectations of key stakeholders also differ. The CAA submission to the Australian Government's Department of Education, Science and Technology stated that: *'Paramedic higher education programs must produce work ready graduate paramedics with not only appropriate clinical ability but a multi skilled practitioner who is responsible for the out of hospital clinical care and safety of their patients and the community as a whole'* (50). This definition of work-readiness is couched in terms of practical competence and discipline skills. This is not surprising, given that historically, the post-employment model was dominant and incorporated burst mode lectures in VE institutions where courses are inherently 'competency' based (that is, students are assessed with respect to competency to perform certain tasks or demonstrate particular skills). The CAA

'Paramedic Professional Competency Standards V2.2 2013' (51) defines competency but does not address the concept of 'work readiness' explicitly. In contrast the concept of 'work readiness' from a HE perspective goes beyond discipline-specific competencies. In HE, courses aim to equip graduates with discipline-specific capabilities and generic capabilities (typically called 'graduate attributes' or 'graduate capabilities') such as the ability to think critically, communicate, problem-solve and be lifelong learners. Eley (31) also draws attention to the need to consider some of these 'soft skills' in relation to understanding what constitutes work readiness, in light of the demand in the paramedic profession for mentoring, as set out in the CAA's Paramedic Professional Competency Standards V2.2 2013 (Competency 9.3 'Participates in the mentoring, teaching and development of others') (51).

Higher education places great emphasis on developing graduates as critical thinkers, to question, challenge and research. There is therefore the potential for confusion when graduate paramedics enter a work environment that is steeped in the realm of 'competences', clinical practice guidelines and specific work instructions. Notwithstanding the problem of defining work readiness (whether this is in terms of competencies or in terms of discipline-specific learning outcomes and generic capabilities as described in HE courses), there is also the question of when this should be measured. Generic capabilities or graduate capabilities are a key component of benchmarking in HE and are typically considered at the end of an academic program, for example, via the 'Course Experience Questionnaire' which forms part of the Australian Graduate Survey, a national survey of graduates from Australian universities. It is common practice for health science programs such as paramedic programs to begin formal clinical practicum components of courses (that form the major clinical training within a course) once the student has completed a prescribed component of the course. Thus, it may be desirable to assess work-readiness at this point in time.

If work readiness is defined in terms of having the capabilities for a life-time working within a field that is likely to change significantly and potentially rapidly over the working life-time of the graduate, then how curricula can be best designed to achieve this is a fundamental issue for educators. As was the case in nursing, the post-employment model of paramedic training was very practically oriented by design and this could be seen as a strength of the model. The pre-employment model (university-based education), in contrast, provides less exposure to the clinical environment and thus clinical skills may be less well developed on graduation, though research by Dawson (15)

(albeit confined to only one university) suggests that by the end of the internship year, supervisors found that graduates of bachelor courses were as skilled as trainees in the old post-employment program. The pre-employment model delivered in an HE institution has significant advantages by its underpinning pedagogical approach that nurtures the development of critical appraisal, research and problem-solving skills, and skills to be life-long learners.

Mentoring is a feature of the CAA *Professional Competency Standards V2.2* Standard 9.3 is the relevant item: '9.3 Participates in the mentoring, teaching and development of others'. In the post-employment model, students have substantial exposure to mentors ('preceptors') whereas in the pre-employment model, this opportunity only arises during clinical practicum and the postgraduate internship (31). Eley cautions that with a growing workforce, there is a growing demand for mentors and these roles are not always filled by senior paramedics, instead sometimes falling to recent graduates (31). Thus, educators need to pay attention to the development of mentoring capabilities in students as part of undergraduate programs. It cannot be assumed that they will simply develop these skills well once they are out in the field. Mentoring programs such as the 'PASS' (Peer Assisted Study Skills) mentoring program have been utilised in educational institutions such as Victoria University in Melbourne as a means of students assisting other students in particular units of study (typically those which are problematic). In this program, the student mentors are trained in mentoring. This has been piloted within the three year Bachelor of Health Science (Paramedics) with positive results. A recent study of final year paramedic students found that while they felt reasonably prepared to enter practice, respondents wanted more clinical placements and in a variety of areas within hospitals and the healthcare system (52). This may suggest that the work-readiness of paramedic students may not only be assisted within the university system but also through expanded engagement with industry.

In considering how best to design paramedic courses that will prepare graduates for an uncertain and changing future, it is prudent to take heed of what other professions have learned. For example, the research of Kilminster and colleagues (38) in medicine that indicates an interdependence between learning, practice and performance and the specific setting in which this occurs, and the notion of critically intensive learning periods, may be very relevant. Most HE paramedic bachelor degree courses are delivered over three years full time equivalent, after which graduates complete an internship with the relevant state ambulance authority (that is their

employer). Given the increasing scope of practice of paramedics, particularly within rural and remote communities, it is suggested that a more effective four year bachelor program could be designed in collaboration with state ambulance authorities that combines the best features of the pre- and post-employment models. That is, a four year program could be developed that provides a strong pedagogical foundation with all that HE offers and sufficient hands-on practical experience under guided mentorship programs in a variety of community settings, including rural and remote communities. In this way, on graduation from the bachelor degree course, new paramedics are better prepared for the work they will undertake.

CONCLUSION

In Australia, increasingly education of the healthcare professions has entered the HE sector and universities, although there are some courses delivered in privately operated education institutions and in the vocational education sector. The paramedic profession, a mainstream healthcare profession that is not yet included in the national regulatory scheme, is undergoing a transition from a post-employment model to a pre-employment model of education, three year degree courses delivered at universities. The move into the universities, along with external course accreditation via a professional association, are landmarks of a profession growing in maturity and legitimization. How to produce work ready graduates for the healthcare professions is a concern for all educators. Fortunately, there is an increasing body of knowledge about work readiness in healthcare professions, including recent research in the field of paramedics. When education of a profession is in a state of transition, such as is occurring in paramedics in Australia, there exist great opportunities to utilise the learning from other professions, collaborating with key stakeholders (the education institutions, the professional associations) and build the kind of courses that really will serve the needs of the Australian community.

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Healthcare profession	Reference	Type of study/outcome variables	Key findings
Medicine	Hill, Rolfe, Pearson, Heathcote, 1998 (7)	Written survey of perceptions of interns working in New South Wales preparedness for hospital practice in eight key areas. Compared graduates of universities using a more traditional program model with graduates of problem-based curricula programs.	Interns perceived that their undergraduate medical training from both traditional and non-traditional medical schools adequately prepared them for hospital practice in the areas of patient management and understanding of science, however problem-based curricula program graduates rated their undergraduate preparedness as higher in the areas of interpersonal skills, confidence, collaboration with other health care workers, preventative care, holistic care and self-directed learning.
Medicine	Dean, Barratt, Hendry, & Lyon, 2003 (6)	Graduates of the first intake of University of Sydney graduate-entry medical program were asked about their preparedness for hospital practice using questionnaires and semi-structured interviews; results were compared with other programs.	Graduate-entry, problem-based program graduates were found to be at least as well prepared for hospital practice as graduates from traditional and undergraduate problem-based programs.
Medicine	Eley 2010 (31)	Junior doctors' perceptions of level of preparedness for hospital work; semi-structured interviews with postgraduate year one and two junior doctors in Queensland, Australia.	Respondents that underwent training in smaller, non-traditional medical schools felt better prepared at internship. Factors that contributed to building confidence identified were: more hands-on experience as students, more patient contact, better grounding in basic sciences. Junior doctors identified a lack of career guidance to help them transition from student to doctor.
Medicine	Kelly, Noonan, & Mongale, 2011 (39)	New interns surveyed at a large Victorian metropolitan health service on self-reported confidence and preparedness for common intern tasks.	Most felt reasonably prepared by their university training for most but not all intern tasks. Domains of work-readiness that could be improved included the preoperative patient review, handover, fluid and medication management, patient admissions, assessment of unstable patients, communication with patients and families, and pain management.

Dentistry	Arena, Kruger, Holley, Millar, & Tennant, 2007 (21)	School of Dentistry in Western Australia aimed to identify the strengths and weaknesses of the curriculum as perceived by graduates and to compare the perceptions of those graduates who completed a focused clinical experiential program (CEP) to those who did not. Survey mailed to graduates, with questions based on the graduate outcomes of the dental school.	Most graduates, whether completing the CEP or not, perceived themselves to be prepared, competent, and confident to practice as dentists. Respondents reported feeling most confident in managing problems that they most frequently encountered during training.
Nursing	Hart & Macnee, 2007 (8)	Cross-sectional written survey in which nurse practitioners (NP) were asked to rate their level of preparedness when they completed their educational program; distributed to NP's at two national conferences.	Results indicate that formal NP education is not preparing new NPs to feel ready for practice. Fifty one percent perceived that they were only somewhat or minimally prepared after completing their basic NP education. Current age, years since graduation from an NP program, and age when attending the NP program did not differ significantly for those who felt prepared versus those who did not.
Nursing	Cleary, Matheson, & Happell, 2009 (44)	Questionnaire based study of participants in a 12 month Australian transition to practice program in Mental Health Nursing; assessed perceived satisfaction and impact on knowledge and confidence.	Participants expressed a high level of satisfaction with the transition to practice program. It was perceived to provide enhancement of knowledge and confidence for graduate nurses entering the profession, and experienced nurses transitioning from one clinical setting to another.
Nursing	Levett-Jones, Gersbach, Arthur & Roche, 2011 (53)	Assessed clinical competence of third year nursing students in Newcastle, Australia.	Findings support the premise that quality clinical assessment requires nursing students' exposure to complex challenges undertaken in authentic clinical contexts, observed by registered nurses who are trained as assessors and have a strong educational and clinical background.
Medicine & Nursing	Walker, Yong, Pang, Fullarton, Costa, & Dunning, 2013 (54)	Investigated work readiness via qualitative interviews with medicine graduates, nursing graduates and organisational representatives at a regional hospital in Australia.	Four factors were found to be important to work readiness: social intelligence, organisational acumen, work competence and personal characteristics. While organisational representatives reported social intelligence and clinical skills as critical to graduate competency, graduates perceived themselves as unprepared in these areas.

Chinese Medicine	Moore, O'Brien, & Canaway, 2010 (9)	<p>Investigation into perceptions of preparedness for clinical practice of final year</p> <p>CM students in Australia. Written survey with Likert scale questions and open-ended responses focusing on eight dimensions relating to practice:</p> <ul style="list-style-type: none"> • Interpersonal Skills, Confidence/Coping Skills, Professional Networks, Professional Practice Management, • Professional Patient Management, Prevention, Holistic Care, and Self-Directed Learning. 	<p>The majority of final-year CM students perceived themselves to be somewhat adequately or adequately prepared to enter the workforce. Responses indicated a range of opinions on the strengths of educational courses and suggestions on how transition to clinical practice could be facilitated. These included the facilitation and development of: mentoring and other external clinic experiences; business establishment and management skills; support networks for graduates; and changes to the course structure/internship.</p>
Chinese medicine	Moore & O'Brien, 2012 (40)	<p>Survey of recent Australian Chinese medicine degree graduates investigating perceptions of confidence in various aspects of clinical practice. Content-validated survey with qualitative outcomes.</p>	<p>Results indicated recent graduates would like more clinical experience, support in developing their business and interpersonal skills, and the option of participating in a formal transition arrangement, such as mentoring, as organised by education providers and/or professional associations.</p>
Occupational Therapy	Dogherty, Stagnitti, & Schoo, 2009 (32)	<p>Anonymous questionnaire of the first cohort of occupational therapist graduates from Deakin University, Geelong.</p>	<p>A significant positive relationship was found between respondents' perception of their curriculum and fieldwork experiences and their preparation for practice.</p>
Paramedics	Waxman and Williams 2006 (24)	<p>Survey of Monash University (Melbourne) pre-employment students</p>	<p>Two-thirds of final year students felt ill prepared for the employment application and selection process. Students were concerned that their education would not be recognised, a lack of workload, geographic isolation once employed, and the perception of being too young.</p>

Paramedics	Dawson 2008 (15)	Paramedic bachelor degree students and supervisors at Victoria University (Melbourne): interviews	<p>Paramedic program provided a good theoretical background but students felt under-prepared in terms of practical experience working with ambulance services. Need for hospital placements identified (to provide experience with hospital environment).</p> <p>Interviews of student supervisors suggest that practical skills of students in the course improve over time after employment and are the same as students trained in the post-employment model (in-house training).</p>
Paramedics	McCall, Wray & Lord, 2009 (55)	Student perception of factors that affect their education in the clinical environment. Focus group discussions with undergraduate Bachelor of Emergency Health (Paramedic) students at Monash University.	Communication, appropriate placements, capacity building and adequate preparation for students emerged as major themes. It was concluded that communication, early identification of issues, and on-going quality evaluation is needed between the University, ambulance services, and students, in order to improve the quality of clinical education.
Paramedics	O'Meara, Tourle, Madigan, and Lighton, 2011 (56)	Longitudinal study design using surveys and a focus group, investigating career intentions and identifying key factors that influence career choices. Conducted at a Charles Sturt University with paramedic and nursing/paramedic undergraduates.	A number of factors were found to influence student career intentions, including personal situation, professional reasons, organisational factors and community expectations. Student needs to be addressed by Universities and paramedic employers include recognition of graduate attributes, attractive working conditions, further education opportunities, and the promotion of the paramedic as a health professional.
Paramedics	O'Brien, Hartley, Dawson & Moore, 2013 (52)	Survey of final year paramedic students at Victoria University, Australia. Written survey with eight content-validated dimensions related to paramedic practice and open-ended questions that elucidated qualitative data.	Clinical practice and placement experiences in the field emerged as key positive aspects of the students' higher education experience, as well as the perception that more and varied clinical placements in the course may better prepare the students for entry into the workforce.

Table 1. Australian Studies on Work Readiness of Healthcare Students and Graduates