

## **PROJECT MANAGEMENT – THE HIGH GROUND OF PROFESSIONALISM OR THE SWAMP OF THE REAL WORLD**

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### **ABSTRACT**

This paper is an exploration of anomalies that exist in the education and training of project managers to assist them in becoming the future members of a truly recognisable and sustainable profession. The current education model for project management (PM) is substantially different to that of other professions and has been examined previously, but there has been little research into where the primary responsibility should lie for developing future generations of project managers. Many questions arise by virtue of the unique nature of PM. Will practitioners see themselves as professional project managers first and foremost, or will 'accidental' project managers continue to see their role as an overlay to their substantive role as engineer, IT specialist, health care worker, etc? Executive committees of professional PM bodies are generally dominated by passionate practitioners, but who lack formal academic PM qualifications. Formal PM education is predominantly delivered by educators without PM qualifications and with limited practical experience in the discipline. Would this be tolerated in professions such as medicine, engineering or architecture? PM desperately needs experienced and qualified educators who can provide a platform for effective education and training based on established pedagogical models, rather than fragmented profit-driven programs.

#### **Keywords**

Education, training, profession, project management

#### **Theme**

Rebuilding and developing the profession

#### **Stream**

Academic

## Introduction

The focus of this paper is on exploring the dimensions of the major theme and sub-themes of the 2010 PMOZ Conference and their implications for education in furthering project management (PM) as a viable and sustainable profession - 'Rebuilding and developing the profession' and 'Emerging trends and issues'. This position paper considers the question of PM as a profession and the relationship between professional bodies and universities. It looks at what is required for the discipline to take its rightful place alongside other recognised professions, and argues the need for formal academic qualifications for project managers. It argues that key stakeholders must coordinate better to eliminate the fragmented and commercially-driven image that undermines PM education and training if it is to evolve into a recognisable and sustainable profession.

## The profession of project management

The rights of project managers to regard themselves as part of a profession have been explored by numerous authors (Barber 2001, p. 953; Curling 1998; Mitra 2001; Turner 1999; Zwerman 2000). PM has often been called the 'accidental' profession (Stretton 1994) and Turner (1999) has examined the nexus between PM as a profession and the role of professional associations. Turner (1999, p. 2) suggests that:

*'...to become a mature profession, it is necessary to develop the theoretical basis of the subject. This means just not continuing to develop and add to the extensive lists of tools and techniques used by practising project managers. It also means developing a set of premises about:*

- *the purpose of project management*
- *the criteria and factors for judging and achieving success on projects*
- *and hence what constitutes good project management practice'*

Dinham and Stritter (1986) differentiate professional education from trades or craft by its 'reliance on theory' (p. 952), and professional initiation through an apprenticeship. One of the distinctions of a profession is the requirement to 'set aside personal beliefs and preferences in favour of the client's best interests' (Dinham & Stritter 1986, p. 953). They describe professional education in terms of 'transforming the student's gestalt from confusion to familiarity, so the student comes to inhabit the professional world'. Despite PM having its roots in the engineering and defence industries, Jaafari (1998, p. 514) suggests that it 'has tended to evolve into an independent discipline...but there is still no coherent and systematic programmes for the preparation of project managers from an early age through to full professional status'. Benson (2001, p. 92) suggests 'that the most important areas of professional practice lie beyond the instrumental boundaries based on technical expertise and go into the more indeterminate areas of practice that deal with uncertainty, uniqueness and value conflict' and that the 'outstanding professionals in all areas, including those with high levels of formal rationality, reflect wisdom, intuition and artistry beyond the instrumental'.

As a guide to understanding what constitutes a profession, it is of value to understand their evolution. The first professions to arise around the sixteenth century in Europe were law, medicine, the clergy, the military and architecture (Piotrowski &

Robinson 2001). Professions were associated with the elite classes as both the providers and consumers of such services came from the aristocratic ruling classes. McConnel et al. (1962, p. 257, cited in Cameron 2001) asserts that 'the primary function of the modern university, as of the medieval university, is professional education'. Piotrowski and Robinson (2001) suggest that 'neither the professions nor the university can be fully comprehended apart from the other or from the social processes that shaped them jointly'. Australian universities changed rapidly after the Second World War driven by the views of federal governments who saw social, economic and financial advantages in achieving national uniformity of skills and educational curricula (Cameron 2001).

During the 1990s, the competency-based movement had a profound effect on professional development and higher education (Barrie et al. 1996; Bowden & Masters 1993; Collins 1993; Hager & Gonczi 1994). In the absence of formal PM programs in Australian higher education institutions, the professional bodies were able to seize the initiative and lay down a platform of national competency standards (Australian Institute of Project Management 1996). The universities have tended to play catch-up since that time and have used their position as self-accrediting institutions to specialise in the delivery of formal postgraduate degree programs. At the time of writing, there was only one university offering an undergraduate degree in PM but that is likely to change quickly over coming years.

Non-registered training organisations have carved out a sizeable niche providing continuing professional education (CPE) courses that are flexible and industry-focused. Registered training organisations (RTOs) and the Technical and Further Education (TAFE) sectors have dominated the training sector offering certificates, diplomas and advanced diplomas structured around the Australian Qualifications Framework (AQF) ([http://www.aqf.edu.au/Portals/0/Documents/Handbook/AQF\\_Handbook\\_07.pdf](http://www.aqf.edu.au/Portals/0/Documents/Handbook/AQF_Handbook_07.pdf) accessed 24 April 2010) and the Australian National Competency Standards for Project Management (NCSPM) (Australian Institute of Project Management 1996).

As PM has tended to be a mid-career overlay upon a prior professional career, universities have focused on Master's degrees and professional doctorates. Such degrees have emerged from the schools of engineering and are now commonly located in business schools. However, there are limited numbers who are undertaking research-based doctoral studies with a view to entering academe. In what way will PM fully emerge as a professional discipline? In business schools, it is seen as a minor player among more established management disciplines. The profile of postgraduate PM students today includes business, education, health, events management, science, environmental studies, research, town planning, architecture, surveying, etc but at what point will those who practise PM cease to define themselves by their previous career and proudly proclaim themselves first and foremost as a project manager?

### **Professional bodies**

Project managers in Australia are represented by two major professional bodies. AIPM is a national body with state-based chapters with some level of autonomy. PMI is a US-based organisation that accredits local chapters within Australia (and other

countries). There is limited information on the makeup of each professional body in terms of member profile and industries represented. Historically PMI membership in Australia was drawn from IT-related industries which were subsidiaries of large US-based parent companies, and AIPM membership has always had a strong engineering, defence, construction and infrastructure focus.

The two professional bodies have drifted along on parallel paths for many years with an unresolved competitive relationship. Membership of each organisation is relatively open, with no specific requirement to have any formal qualification in PM. A Certificate IV qualification under the AQF (Australian Qualifications Framework) in any area plus five years experience in PM is the minimal requirement for full membership of AIPM (<http://www.aipm.com.au/html/benefits.cfm> 23 April 2010), whereas membership of the PMI is 'open to any individual interested in project management' (<http://www.pmi.org/Marketplace/Pages/default.aspx?Category=MembershipIndividual> 23 April 2010). Each organisation has a similar stated aim to further the cause of PM but each goes about it in a slightly different way, particularly in regard to professional recognition and development which goes to the hub of this discussion.

### **Professional recognition and development – AIPM**

To promote professional standing, AIPM has developed a Registered Project Manager (RegPM) program offering competency-based certification at various levels:

- Certified Practising Project Practitioner (CPPP) relates to team members (equivalent to a Cert IV under the AQF)
- Certified Practising Project Manager (CPPM) relates to project managers with responsibility for individual projects (equivalent to a Diploma under the AQF)
- Certified Practising Project Director (CPPD) relates to project or program directors looking after multiple projects (equivalent to an Advanced Diploma under the AQF) (<http://www.aipm.com.au/html/regpm.cfm> retrieved 28 April 2010)

The certification process for project managers was captured (if not hijacked) by members of the private training sector who were highly active in the early stages of the formation of the Project Manager's Forum, the forerunner of the AIPM. This coincided with the global development of the competency-based movement in the early 1990s (Cameron 2001), and the AIPM was active in development of the initial Australian National Competency Standards for Project Management (NCSPM) in the mid 1990s (<http://www.aipm.com.au/html/pcspm.cfm> retrieved 28 April 2010). Rather than adopting and encouraging formal university education as a model for development and recognition of expertise in PM, a competency-based system was chosen. A professional certification model based on educational equivalency at the low end of the AQF scale runs the risk of devaluing the perceived capability of the holder. Many of the RegPM-certified project managers have experience, knowledge and skills that relate to far higher levels of education and training, but they are unable to have that capability recognised unless they undertake additional university education.

Certification models are backward looking rather than forward looking and offer little guidance as to how PMs might achieve basic competencies, let alone higher-order competencies that are essential to the practice of a profession (Cheetham & Chivers

2000, 2005). It has been left to industry to develop fragmented, and in many cases poorly conceived and delivered, training programs for professional practice. The original NCSPM competency framework and the current AIPM National Competency Standards for Project Management (NCSPM) have been based around the relevant editions of the Guide to the Project Management Body of Knowledge (PMBOK) developed by the Project Management Institute, and this ensures that there is some level of global consistency in the competency framework. Industry appears to place significant value on the RegPM certification, and this has been evidenced over the years by the comprehensive support of the program by the Defence Materiel Organisation (DMO) through their internal certification processes which have incorporated the RegPM program into their Project Management Certification Framework (PMCF) (Defence Materiel Organisation 2005). In recent times, the PMCF seems to have been put on hold, and the focus seems to have shifted away from 'projects' to one on the delivery of 'capability' and 'professionalisation' of staff through the DMO Institute.

*"The CEO DMO's professionalisation initiative is a central strategy in meeting the DMO's challenges now and into the future. The professionalisation initiative, delivered through the DMO Institute, has resulted in over 1,400 DMO staff being certified with professional bodies, or currently enrolled in certified programs."*

*(Defence Materiel Organisation 2009, slide 21 of 40, accessed 28 April 2010)*

From an education and training perspective, AIPM recognises education and training programs provided by providers including niche training organisations, registered training organisations, Technical and Further Education (TAFE) institutions and universities ([http://www.aipm.com.au/html/aipm\\_endorsed\\_courses.cfm](http://www.aipm.com.au/html/aipm_endorsed_courses.cfm) accessed 29 April 2010). There is little real scrutiny nor evaluation of the actual programs, their delivery, the capability and qualifications of instructors nor learning outcomes, as is carried out for university programs which are controlled by rigorous internal processes monitored by the Australian Universities Quality Agency (AUQA) (<http://www.auqa.edu.au/> accessed 2 May 2010). Within the PM discipline, there is little attempt to coordinate nor promote development of a national curriculum across the education and training sector, and it remains a commercially-competitive environment driven by market share, revenue and profits rather than quality learning outcomes for project managers, however those might be defined.

### **Professional recognition and development – PMI**

PMI has taken a slightly different approach towards professional recognition and development. Initially, recognition of PM competency was based substantially on successful completion of a lengthy multiple-choice questionnaire. From a pedagogical perspective, this is a dubious way of evaluating the knowledge, skills and attributes of a professional practitioner. PMI has progressively expanded the levels of certification from the original Project Management Professional (PMP) and the levels now include:

- CAPM – Certified associate in PM
- PMI-SP – PMI Scheduling professional
- PMI-RMP – PMI Risk management professional
- PMP – PM professional

- PgMP – Program management professional  
(Project Management Institute 2010)  
(<http://www.pmi.org/CareerDevelopment/Pages/AboutPMIsCredentials.aspx> accessed 28 April 2010)

The value of such certification is undermined by the commercially-motivated training organisations that tend to feed off such programs. There are numerous examples of advertised programs that 'guarantee' results with less than a week's training.

*"This intensive 4-day, no study course is designed to completely prepare you for the PMP exam in a fun and effective manner—with no required studying after class!"*

([http://www.rmcproject.com/courses/view\\_all\\_courses.aspx](http://www.rmcproject.com/courses/view_all_courses.aspx) accessed 2 May 2010)

*In a 4-day program, "participants learn valuable strategies for exam taking and have the opportunity to practice in a closely simulated PMP exam environment with over 1,300 questions"*

(<http://www.pmstar.org/> accessed 2 May 2010)

Again, this 'Anthony Robbins' approach (<http://www.tonyrobbins.com/> accessed 3 May 2010) to PM diminishes the value of the certification. It is difficult to imagine that historically recognised professions would see this process as adequate nor appropriate for achieving professional status. As noted on a blog, 'PMP simply put is crap and nothing more then (sic) a money making scheme for the PMI organization' (<http://www.reformingprojectmanagement.com/2009/04/13/911/> accessed 29 April 2010).

### **When will others see us as professional?**

What lessons can we learn from other professions? The following brief summary of the attributes of recognised and aspiring professions (see also Table 1) helps to illustrate the key differences:

- Medicine and dentistry have protected legal status through government registration by means of undergraduate and postgraduate university degrees, and professional status through membership of professional bodies
- Architects have protected legal status through government registration by means of professional examination and an undergraduate university degree, and professional reputation through membership of a national professional body
- Law has protected legal status through the court system based on academic qualifications at undergraduate or postgraduate level, as well as membership of a professional body based on qualifications
- Teaching has protected status through government registration and membership of a professional body based on qualifications
- Engineers do not have protected legal status, but establish their professional reputation through membership of a professional body via undergraduate university degree and certification by that body
- Accounting does not have protected legal status, and achieves professional reputation through membership of professional bodies based on an undergraduate university degree and certification by professional bodies e.g. CPA
- The IT industry has an undefined and unprotected legal status

- PM does not have protected legal status, and achieves professional reputation through membership of a professional body based on work experience with or without a university degree

Table 1: Summary of attributes of recognised and aspiring professions

	Medicine / Dentistry	Architecture	Law	Teaching	Engineering	Accounting	IT	PM
Protected legal status	Yes	Yes	Yes	Yes	No	No	No	No
Government registration board	Yes	Yes	Yes	Yes	No	No	No	No
Post degree professional practice period for registration	Yes	Yes	Yes	No	n/a	n/a	n/a	n/a
UG degree programs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Formal practical training component of UG degree	Yes	Yes	No	Yes	No	No	No	n/a
Accreditation/endorsement of UG degree by professional body	Yes	Yes	Yes	No	Yes	Yes	Yes	No
UG degree required for membership of professional body	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Industry certification offered by professional body	No	No	No	No	Yes	Yes	Yes	Yes

There are clear differences between the approach adopted by the PM discipline to establish professionalization and that of other recognised professions.

#### What do PMs have to know and be able to do?

*'The study of a problem whose solutions are known is training; the study of a problem whose solutions are unknown is education'* (Theobald 1985, cited in Dunn 1985, p. 48).

There are numerous models for defining the competencies that project managers require, and this adds to the confusion (American Society for Advancement of Project Management Inc. 2001; Australian Institute of Project Management 1996; Ayer & Duncan 1998; Birkhead, Maxwell & Sutherland 2000; Crawford 2000; Frame 1999; Global Performance-Based Standards for Project Management Personnel 2003; Huemann 2000; Project Management Institute 2001). Universities have responded to industry concerns about work-readiness of graduates by developing comprehensive graduate attributes (Barrie 2005; Bowden et al. 2007; University of Southern Queensland 2007). These do not correspond to the competencies defined by the professional bodies, adding to the conflict.

*In the varied topography of professional practice, there is a high, hard ground overlooking a swamp...the problems of the high ground tend to be relatively unimportant to individuals or society at large...while in the swamp lie the problems of greatest human concern* (Schon 1987, cited in Cervero 2001, p. 25).

Universities tend to claim the high ground in regard to professional education, so what is the significance for education and training if we believe 'that professionals

conduct most of their practice in the swamp of the real world?' (Cervero 2001, p. 25)? What do project managers really do, and what should they be able to do? What is a competency and what is a capability (Bowden 2002)? What is an attribute and what are performance standards? The AIPM took the initiative with the Australian National Competency Standards for Project Managers, but the PMI has the ability to dominate the agenda with its Project Manager Competency Development Framework through the sheer scale of its influence across the American and Asian continents (Project Management Institute 2007). Professional bodies in other parts of the world have developed their own competency frameworks and independent bodies such as GAPPs (Global Alliance for Project Performance Standards 2010) are developing 'standards that describe levels of acceptable workplace performance' (<http://www.globalpmstandards.org/> accessed 2 May 2010).

Even if agreement can be reached on the appropriate competencies, capabilities and attributes for the various levels of PM practice in the respective industry sectors, what guidelines will exist to assist education and training providers in developing those qualities in the graduates of their programs? Dinham and Stritter (1986, p. 964) have asked:

- What are the attributes of students that will result in better-prepared professionals?
- What are the aspects of professional education for students to master?
- What are the characteristics of effective practical instruction?
- What are the optimal characteristics and locations of sites in which practical learning takes place?
- What are the most efficient and effective methods of evaluating a learner's practical performance?
- What is the most effective approach for assessing clinical instruction for improvement?

Farivarsadri (2001) asserts that a university education 'is different from training that is only giving knowledge and skills necessary to serve a profession' and that:

*'a holistic university education aims at addressing the whole person, developing the personalities of students in different dimensions, making them know how to acquire knowledge, to communicate, to be aware of his (sic) own values, and those of the other's as well...This education in one end should prepare student for the profession with necessary abilities and skills and on the other end should educate them as people aware of social realities, being able to see the problems, to find solutions, have critical thinking, have their own values, etc'* (Farivarsadri 2001, p. 2).

Academics are often asked whether it is better to gain professional certification or to gain an academic qualification. Our answer is that it is better to have both as they are different processes with different outcomes. Many prospective students receive well-intentioned advice that an academic qualification has little value in industry. This is either a sad indictment of industry practitioners who have a short-sighted or distorted view of the role and value of tertiary education, or a sad indictment of universities if we are really perceived to be so irrelevant in the professionalization of the discipline.



## **How will we achieve a sustainable project management profession?**

At present, the role of universities is more one of taking 'accidental' project managers and undoing the trauma of the accident, but this is not an effective nor sustainable model for the training and development of members of a genuine profession. Universities will ultimately inherit greater responsibility for developing truly professional project managers, but it will require greater consensus between educators, the industry and the professional bodies on what is expected of future project managers and how to go about the training and education process in an integrated and coordinated way. At this stage, there is no recognised model for a university curriculum and there is little, if any, coordination between academics in the way they go about the education of future PMs.

Current university academics are mostly baby-boomers, and the average age is now 50 compared to 46 in 2006 (Hartmann 2010). Approximately 24 per cent of university academics are due to retire in the next five years with another 5000 more retirees over the following decade. Who will replace the existing generation of academics? Should academics come from industry, or should they be career academics who have never managed a project but have a lot of opinions about it? As a positive sign for the profession, there is evidence of better-structured research models as the graduates from postgraduate programs undertake doctoral research (Walker 2000) to further the theoretical body of knowledge that underpins training and education. As these practitioners develop the requisite knowledge and skills, they will represent the academics of tomorrow to help PM become a genuine and well-respected profession.

## **In conclusion – how to move towards true professionalism**

For the PM discipline to take positive steps towards true professionalism, the existing professional bodies, the broader community of practitioners, education and training bodies and universities must work together to implement longer-term strategies to align the core values and standards of PM with those of recognised professions, including:

- Recognition that universities must take a more responsible role in undertaking research to identify holistic educational and training frameworks that foster the development of future professional project managers,
- Working collaboratively to define and endorse a curriculum, assessment models and graduate attributes that reflect true professional capabilities at various stages of PM careers,
- Recognition that formal undergraduate and postgraduate qualifications in PM should eventually form the basis of full membership of the professional bodies, with an option for alternative experience-based evaluation models administered by an independent body,
- Better articulation between programs delivered by RTOs, TAFEs and universities to eliminate unnecessary overlap between educational pathways,
- Encouraging greater uniformity between the programs offered by RTOs and TAFEs to ensure that learning outcomes are similar and of an appropriate standard

- Providing support for universities to develop undergraduate programs in PM through greater recognition of the value of tertiary education,
- Formation of an industry body to encourage development of a uniform curriculum framework that can be openly shared across all universities and training bodies,
- Improved processes and criteria for recognition and endorsement of educational and training programs by all providers to ensure that they are of a professional standard
- Re-structuring of professional certification models to eliminate the constraints related to the lower-levels of the Australian Qualifications Framework, and
- Encouraging universities to capture the knowledge and expertise of experienced practitioners through full-time and part-time careers in academe that are recognised and highly respected within the PM community.

### List of references

American Society for Advancement of Project Management Inc. 2001, *ASAPM Project Managers' Competency Model*, ASAPM, viewed 14 March 2003, <[http://www.asapm.org/edu/e\\_compmodel.asp](http://www.asapm.org/edu/e_compmodel.asp)>.

Australian Institute of Project Management 1996, *National competency standards for project management*, Australian Institute of Project Management, Brisbane.

Ayer, FL & Duncan, WR 1998, 'Project Manager Competence and Competencies', *PM Network*, pp. 4343-44.

Barber, R 2001, *Project management as a profession: challenging the paradigm*, Australian Defence Force Academy, Canberra.

Barrie, S 2005, *Understanding graduate attributes in a changing world*, Griffith University, Brisbane, 8 October, <<http://www.itl.usyd.edu.au/graduateattributes/griffithbarrie.pdf>>.

Barrie, S, McAllister, L, Mortenson, L, Worrall, L & Dawson, V 1996, *Pathways to professional competence: Supporting student learning*, Perth, 8-12 July, <<http://www.herdsa.org.au/confs/1996/barrie.html>>.

Benson, R, Hardy, L & Maxfield, J 2001, *The international classroom: Using reflective practice to improve teaching and learning*, Melbourne, 9-12 December, <<http://www.medfac.unimelb.edu.au/ascilite2001/pdf/papers/bensonr.pdf>> <http://www.ascilite.org.au/conferences/melbourne01/pdf/papers/bensonr.pdf>>.

Birkhead, M, Maxwell, T & Sutherland, M 2000, 'Core competencies required of project managers', *South African Journal of Business Management*, vol. 31, no. 3, pp. 99-106.

Bowden, J 2002, *Competency-Based Education - Neither a Panacea nor a Pariah*, viewed 23 July 2002, <<http://crm.hct.ac.ae/018bowden.html>>.

Bowden, J & Masters, G 1993, *Implications for Higher Education of a Competency-Based Approach to Education & Training*, Australian Government Publishing Service, Canberra.

- Bowden, J, Hart, G, King, B, Trigwell, K & Watts, O 2007, *Generic capabilities of ATN university graduates*, Teaching and Learning Committee Australian Technology Network viewed 9 September 2007, <<http://www.clt.uts.edu.au/ATN.grad.cap.project.index.html>>.
- Cameron, H 2001, 'Monitoring Standards for Professional Education', *Journal of Vocational Education and Training*, vol. 53, no. 2, p. 279.
- Cervero, RM 2001, 'Continuing professional education in transition - 1981-2000', *International Journal of Lifelong Education*, vol. 20, no. 1, pp. 16-30.
- Cheetham, G & Chivers, G 2000, *Towards an holistic approach to professional learning and development*, AERC, <<http://www.edst.educ.ubc.ca/aerc/2000/chiversg&cheethamg-web.htm>>.
- 2005, *Professions, competence and informal learning*, Edward Elgar, Cheltenham, UK.
- Collins, C (ed.) 1993, *Competencies: the competencies debate in Australian education and training*, The Australian College of Education, Deakin, Australia.
- Crawford, L 2000, *Project management competence for the new millennium*, International Project Management Association, London, <<http://www.pmcompetence.net/PPG/download/00ipma.pdf>>.
- Curling, DH 1998, *Globalisation of the project management professional*, PM Forum, viewed 11 January 2001, <<http://www.pmforum.org/docs/prof2col.htm>>.
- Defence Materiel Organisation 2005, *Program managers certification framework*, Department of Defence, Canberra.
- 2009, *DMO: Inside the Defence Materiel Organisation*, Australian Government Department of Defence, Canberra, 28 April 2010, <[http://www.defence.gov.au/dmo/id/publications/Inside\\_the\\_DMO\\_09.pdf](http://www.defence.gov.au/dmo/id/publications/Inside_the_DMO_09.pdf)>.
- Dinham, SM & Stritter, FT 1986, 'Research on professional education', in M Wittrock (ed.), *Handbook of research on teaching*, 3rd edn, The American Educational Research Association, Simon & Schuster Macmillan, New York, pp. 952-70.
- Dunn, SL 1985, 'The changing university: survival in the information society', in E Cornish (ed.), *The computerised society: living and working in an electronic age*, World Future Society, Bethesda, pp. 47-52.
- Farivarsadri, G 2001, 'A critical view on pedagogical dimension of introductory design in architectural education', paper presented to Architectural Education Exchange AEE2001, Cardiff, 11-12 September.
- Frame, JD 1999, *Project management competence: Building key skills for individuals, teams and organizations*, Jossey-Bass Inc, San Francisco.

Global Alliance for Project Performance Standards 2010, *Project Manager Standards*  
Global Alliance for Project Performance Standards  
<<http://www.globalpmstandards.org/index.php/project-manager-standards/download-latest-update.html>>.

Global Performance-Based Standards for Project Management Personnel 2003,  
*Global performance based standards for project management personnel, working report No 1*, Lille, France.

Hager, P & Gonczi, A 1994, 'General issues about assessment of competence',  
*Assessment & Evaluation in Higher Education*, vol. 19, no. 1.

Hartmann, K 2010, 'Academics thrive by degrees', *The Australian*, 13-14 March.

Huemann, M 2000, *Individual project management competences – The need for project management knowledge and experience*, International Project Management Association, London, May 2000, <[http://www.wu-wien.ac.at/pmg/forschung/docs/individual\\_pm\\_competences.pdf](http://www.wu-wien.ac.at/pmg/forschung/docs/individual_pm_competences.pdf)>.

Jaafari, A 1998, *Project managers of the next millennium: Do they resemble project managers of today?*, Ljubljana, Slovenia, 10-13 June.

Mitra, S 2001, 'Project management: a convergent profession', paper presented to Project Management in Society Proceedings, Sydney, Australia, 17 October 2001.

Piotrowski, A & Robinson, JW (eds) 2001, *Discipline of Architecture*, University of Minnesota Press, Minneapolis.

Project Management Institute 2001, *Project Management Competency Development Framework Exposure Draft, Version 3*, Project Management Institute, Newtown Square, USA.

---- 2007, *Project Manager Competency Development Framework - Second Edition*  
<<http://www.pmi.org/Resources/Pages/Library-of-PMI-Global-Standards-People.aspx>>.

---- 2008, *A Guide to the Project Management Body of Knowledge*, 4th edn, Project Management Institute, Newtown Square, USA.

---- 2010, *About PMI's Credentials*, Project Management Institute, viewed 28 April 2010,  
<<http://www.pmi.org/CareerDevelopment/Pages/AboutPMIsCredentials.aspx>>.

Stretton, A 1994, 'A short history of modern project management - Part one: the 1950s and 60s', *The Australian Project Manager*, vol. 14, no. 1, pp. 36-7.

Turner, JR 1999, *Is project management a profession?*, PM Forum, 29 April 2010, Internet website, <<http://www.pmforum.org/library/papers/1999/pmprof.pdf>>.

University of Southern Queensland 2007, *Qualities of a graduate*, viewed 9 September 2007, <<http://www.usq.edu.au/futurestudents/support/gradquals.htm>>.

Walker, DHT 2000, 'An evolution of project management education', *The Building Economist*, pp. 13-9.

Zwerman, B 2000, 'Project manager - profession/position/activity?', paper presented to IRNOP: 14th Conference of the International Research Network on organisation by projects, Sydney, Australia, 9-12 January.