

Examining certification in project management

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1 Introduction

In 2007, the United States government created a set of project management certifications (Denett, 2007) independent of the existing certifications already used in the profession. The motivation is not hard to guess: the public is sensitive to how tax dollars are spent. Government projects have had several large and embarrassing failures. Perhaps the most grand of these is an enterprise resource planning system that was intended for the United States Air Force. The project, called "Expeditionary Combat Support System (ECSS)" began in 2005, and had committed over one billion dollars in cost by the time the contract was terminated in March 2012. When the contract was terminated, estimates for completion ran into additional billions and the expected benefit would not be provided (Kanaracus, 2013).

In testimony before Congress, Government Accountability Office Director of IT Issues David Powner (2013) said "federal IT projects too frequently incur cost overruns and schedule slippages while contributing little to mission-related outcomes." He included several key examples in addition to the ECSS failure, concluding that 190 federal projects were at risk in 2013, totalling \$12.5 billion.

This paper examines the purpose, benefits, and disadvantages of professional certification in general. The federal project management certification is compared to existing certifications, and the validity of creating the certification is examined. Finally, this paper concludes with recommendations for organizations considering implementing their own internal certification and educators interested in making certification a part of their curriculum.

2 Certifications

The notion of professional certification is present in many modern professions. Hyland and Muchinsky (1990) reported over 800 government-regulated (by license or certification) industries in the United States, with many more regulated by industry or other non-governmental organizations. Certification can be traced back to the medieval guilds, although professions as we understand them are largely a twentieth century invention (Hyland & Muchinsky, 1990). Unlike the guilds, which acted to limit the practice of a trade to a small cadre of practitioners, information technology certifications can serve to expand the labor pool (Adelman, 2000).

Unlike the licenses that are the hallmark of some professions (e.g. law and medicine), certifications are not mandatory for practice. Licenses are intended as a public defense against incompetent practitioners (Bratton, 1984). A license grants the right to practice, whereas a certification grants recognition or title (Hyland & Muchinsky, 1990). As such, certifications are not generally required to begin a profession but are used to indicate experience and advanced competence (Wiley, 1996).

Professional certification is based on the assumption that clients are unable to evaluate the qualification of practitioners, but that other practitioners are able (Bratton, 1984). This further requires that practitioners are able to come to a general agreement on what constitutes a competent professional (Wilhelm, 1995). In order to remain viable, practitioners must choose to seek the certification (Bratton, 1984) and clients must recognize that the certification has value.

Certifications may be used to help define and distinguish a profession. A profession is defined by six characteristics (Pugh, 1989):

1. "A particular self-conscious mindset among academics and practitioners"
2. A codified body of knowledge
3. "Development of a social ideal to unite those working within an occupation"
4. Formal organization of members (e.g through unions or professional societies)
5. A hall of fame (this is often an informal list of well-known practitioners)
6. A code of ethics

Morris, Crawford, Hodgson, Shepherd, and Thomas (2006) argue that the field of project management does not meet the definition of a profession, so the presence of project management certifications is partly a move by the community of practice to enhance the perceived distinctiveness of the discipline. However, the model of professionalism proposed by Cegielski, Rebman, and Reithel (2003) (see Figure 1), requires certification, so there is some disagreement in the literature as to when the creation of a certification is appropriate.

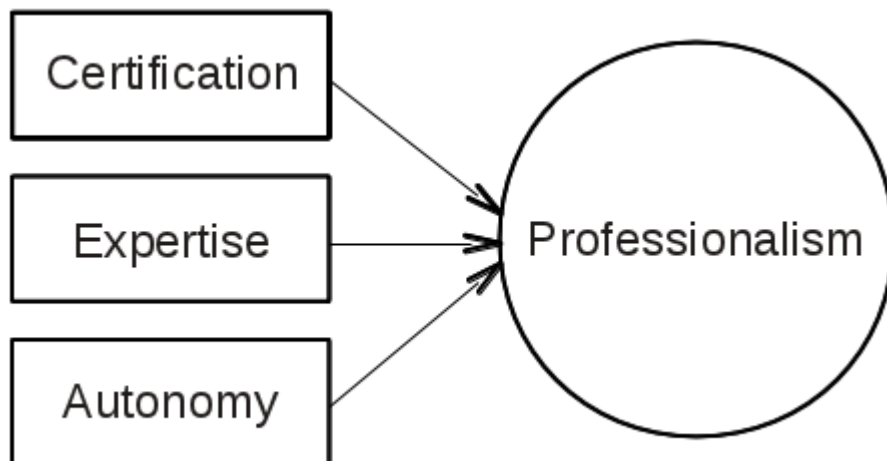


Figure 1: The elements of professionalism as proposed by Cegielski et al. (2003).

Certifications can vary between and within professions. For example, the Red Hat Certified Engineer exam requires a hands-on laboratory component, while other information technology certifications are based solely on multiple choice

exams (Adelman, 2000). Most certifications share a focus on job skills relevant to the profession and not the interpersonal skills that the profession may require (Hyland & Muchinsky, 1990). Certifications may be awarded by a vendor for a specific product or by a third-party, but are generally not awarded by universities (Adelman, 2000). As such, it is inappropriate to consider academic degrees to be certifications. That is not to say that academia has no relationship to certification. In fact, a healthy certification program will have a strong bi-directional relationship with the academy as discussed later in this paper.

2.1 Purpose

As mentioned previously, professional certifications serve a variety of purposes. Certifications are developed in response to a need to specify what skills comprise professional competency and to identify individuals capable of addressing current and future challenges in the field (Wiley, 1996). Crawford (2005) defines several types of competency, although "knowledge" and "skill" are the two most applicable to certification exams. The skills on a certification exam are generally not those of a beginning practitioner, but those gained after years of experience, regardless of whether the certification has a minimum experience requirement (Wiley, 1996).

Bratton (1984) defined four precepts for a certification:

1. "Competencies reflect the skill of a professional regardless of current position, degree, or type of training"
2. Evaluation is performance-oriented, not academic-oriented
3. All competent professionals should be able to perform most of the listed competencies
4. The competencies should reflect the skills of experienced practitioners, not students, trainees, or entry-level professionals

Although Bratton was specifically addressing a certification in training and instructional design, his precepts, when generalized, form a reasonable base for all certifications.

Ultimately, the goal of all professional certifications is to promote the competencies of individual practitioners and enhance the overall skill level of the community (Wiley, 1996). Although benefits are realized from certifications, as discussed in the following section, certificates are not a panacea. Cegielski et al. (2003) noted that completion of formal education requirements is not a guarantee of the ability to skillfully apply the knowledge. Likewise, the ability to pass a certification exam is not a guarantee that the certified practitioner will routinely and correctly apply the skills required.

2.2 Benefits

Professional certifications have claimed and evidence-based benefits to offer to individual practitioners, organizations, and the profession at-large. Perhaps the greatest, and most predictable benefit to the individual is the very act of preparing for the certification (Wiley, 1996). At a minimum, preparing for a certification exam requires study of the profession's body

of knowledge. If the exam requires completion of training courses or demonstrated application of competencies, then the preparation is further beneficial. The preparation steps also provide a practitioner with a tool to perform self-assessments and guide professional growth (Bratton, 1984).

Benefits are not necessarily limited to improved competencies. In some organizations, career advancement and pay incentives are tied to certifications earned (Wiley, 1996). Indeed, some mid- and senior-level positions require a certification for a candidate to even receive consideration. The third-party recognition inherent in a certification may also give a practitioner more mobility to move to other organizations (Wiley, 1996).

For certifications that do not require a particular educational background, certification can present a more economical alternative to higher education. The lower price and shorter time to completion result in a favorable opportunity cost compared to traditional degree programs. Additionally, the barrier to entry can be very low, especially for areas of strong technical focus, since candidates will be accepted for the examination if they are able to pay the required fee. (Adelman, 2000).

Organizations can benefit from certification as well. Proponents of certification reason that by improving individual employees as a result of their certification preparation, the staff become higher-performing overall. Additionally certifications can be used to assess the qualifications of external consultants (Wiley, 1996). Similarly, Kemp (2003) concluded that certifications allow an organization to determine who is qualified to fulfill a job's requirements. Certifications can be used to compare qualifications between individuals and across international boundaries. The last of these points is not necessarily true of academic degrees, making certification particularly appealing in a global labor market.

McHugh and Hogan (2009) argued in favor of certifications claiming that organizations can enjoy better project success rates. The success is attributable, they claim, to progress monitoring and the consistent use of appropriate tools and methodologies, which results in predictable and controllable results. They further argue that certification fosters the development of a defined career path for practitioners, which can aid employee morale and retention.

The profession at-large benefits from a certification process because it necessarily means the profession's body of knowledge must be codified (Wiley, 1996). This codification provides guidance for the shaping of academic curricula relevant to the field (Bratton, 1984; Wiley, 1996). The inability to obtain certification may push unqualified practitioners out of the field, which results in a rise in mean competence (Hyland & Muchinsky, 1990). Arguably, this last point is of benefit not only to the profession, but to society in general, however fields where the presence of a under-competent practitioner poses grave danger should already have licensure requirements.

2.3 Disadvantages

Professional certification programs are not without disadvantages. Disadvantages are manifest as negative impacts on individuals, organizations, and the profession. There are disadvantages inherent in any certification program as well.

Perhaps the key disadvantage is the fact that certificates are no guarantee of competence. Part of the problem is that even when an exam has a hands-on component, but especially when it consists of multiple-choice questions, it can be difficult to assess a practitioner's real-world performance (Bratton, 1984). Even a perfectly-designed certification process

cannot ensure that the certified practitioner will continue to properly apply the accepted methods (Summers, 2011).

Despite the decades-long history of certifications, there are few scholarly works that investigate the impact on job performance from certification. A study of wastewater treatment workers by Hyland and Muchinsky (1990) concluded "one cannot draw inferences about job performance on the basis of certification test scores." Although the authors conceded that their study methodology may be flawed, additional research has come to the same conclusion. Cegielski et al. (2003) found no difference in the perception of end users between networks administered by certified and non-certified professionals. Finally, Crawford (2005) found no relationship between the perceived performance of project managers and their performance against standards.

In addition to a lack of evidence for efficacy, investigations (e.g., Wiley, 1996) found no clear evidence for promotion or increased pay. If a practitioner's employer is not willing to pay for certification, the practitioner is left to pay the necessary costs. Certification may lead to a narrowed focus for practitioners (Wiley, 1996) which may serve to limit future career opportunities. Certifications can suffer a dilution effect as well, with the differentiation provided by a certification diminished as more practitioners earn it (Randall & Zirkle, 2005).

Organizations who pay for certification for their employees incur the cost of the certification process (Wiley, 1996). In addition, organizations can see their benefits diminish with the dilution effect observed by Randall and Zirkle. The profession at-large can suffer from a "gatekeeping" effect (Wiley, 1996), where otherwise-qualified individuals are kept from practicing or advancing. Certification also vests control of the future course of the profession in a small number of organizations (Kemp, 2003).

2.4 Internal Certifications

Internal certifications are slightly different from the certifications discussed so far. An internal certification is one developed by an organization for use only by employees of the organization. Internal certifications will often leave out elements of external certification not relevant to the organization (Tannenbaum & Alliger, 1998). Because project management best practices are, to a degree, dependent on organizational culture and structure (Kerzner, 2010), it stands to reason that an organization may wish to focus on their own procedures.

While internal certifications do not require paying money to a third-party certification administrator, there are definite costs involved. Tannenbaum and Alliger (1998) identified several sources of additional cost: development of training material and certification material, maintenance costs, and expertise required to validate the certification. Determining the cost and benefits of an internal certification program is an exercise left to each organization considering such an endeavor.

3 Project Management Certifications

Project Management Institute (2012) claims having over 35% of project managers holding a Project Management Professional certification is a success factor for projects. Although (Morris et al., 2006) could find no scholarly studies of

the effects of certification on project success, recent work by (Catania, Armstrong, & Tucker, 2012) found no evidence of a difference in project success rates between certified and uncertified project managers. So if there is no evidence for certification improving success rates, why certify? The drive for certification is attributed to two major factors: a desire by senior management to have a uniform project management approach and an organizational desire to achieve Capability Maturity Model Integration (CMMI) certification (McHugh & Hogan, 2009).

Although a number of certifications for project management exist, this paper is only concerned with three. The first two are well-established: the Project Management Professional (PMP) certification administered by the Project Management Institute and the Projects in Controlled Environments, version 2 (PRINCE2) developed by the United Kingdom's Office of Government Commerce. In contrast, the Federal Acquisition Certification for Program and Project Managers (FAC-PPM) developed by the United States Office of Federal Procurement Policy is relatively new. This section will focus on introducing these certifications, comparing them, and identifying weaknesses.

3.1 PMP

The PMP is the most widely-recognized project management certification (Carbone & Gholston, 2004), with over 400,000 active certification holders worldwide (Catania et al., 2012). It is based on the Project Management Body of Knowledge published by PMI (Morris et al., 2006), which is depicted in Figure 2. Post-secondary education is not required to achieve a PMP certification, however the minimum experience required is reduced for holders of a bachelor's degree. Non-degreed certification candidates must have at least five years of project management experience, while degreed candidates only need three. 35 hours of project management education is required for all candidates. (Project Management Institute, 2013)

The PMP examination contains 200 randomly-selected multiple-choice questions. Once certification is granted, PMP holders must obtain 60 professional development units (PDUs) every three years in order to remain active. Although the PMP is a single-level certification, PMI offers other certifications at a lower (Certified Associate in Project Management) and higher (Program Management Professional) level (Project Management Institute, 2013).

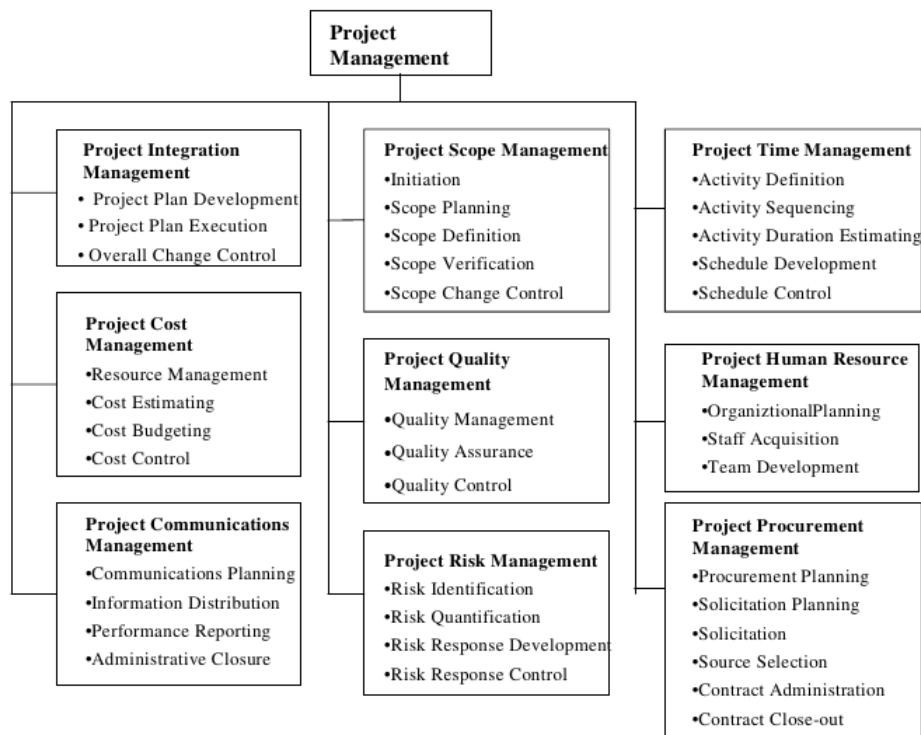


Figure 2: The Project Management Body of Knowledge as depicted in Morris et al. (2006).

3.2 PRINCE2

PRINCE2 is both a project management framework and a set of certifications based on that framework. The three PRINCE2 certifications are Foundation and Practitioner, and Professional. The Foundation certification is an entry-level certification, whereas Practitioner is geared toward the experienced project manager and Professional is the highest level which requires observation (Hinde, 2012). For the purposes of this study, we will consider PRINCE2 Practitioner to be analogous to the PMP certification. The use of the term "PRINCE2" should be understood to mean PRINCE2 Practitioner except where another meaning is explicit.

PRINCE2 certification is based on the Association for Project Management's body of knowledge (Morris et al., 2006), which is depicted in Figure 3. There is no academic education requirement for PRINCE2 certification, but it does require completion of an approved training course and passing the PRINCE2 Fountation exam (which may be done concur-

rently with the PRINCE2 Practitioner exam) (Hinde, 2012). There does not appear to be an experience requirement to earn PRINCE2 certification, and PRINCE2 does not require recertification (McHugh & Hogan, 2009). The PRINCE2 examination consists of nine main questions, each with 12 multiple choice sub-questions, and must be completed within two and a half hours (Hinde, 2012).

Project Management in context				
Project Management		Project Context		
Programme Management		Project Sponsorship		
Portfolio Management		Project Office		
Planning the strategy				
Project Success Criteria and Benefits Management		Project Management Plan		
Stakeholder Management		Risk Management		
Value Management		Quality Management		
		Health, Safety & Environment		
Executing the strategy	Techniques	Business and Commercial	Organisation & Governance	People & the profession
Scope Management	Requirements Management	Business Case	Project Life Cycles	Communication
Scheduling	Development Management	Marketing & Sales	Concept	Teamwork
Resource Management	Estimating	Financial Management	Definition	Leadership
Budgeting & Cost Management	Technology Management	Procurement	Implementation	Conflict Management
Change Control	Value Engineering	Legal Awareness	Hand-over and Close-out	Negotiation
Earned Value Management	Modelling & Testing		Project Reviews	Human Resource Management
Information Management and reporting	Configuration Management		Organisation Structure	Behavioural Characteristics
Issue Management			Organisational Roles	Learning & Development
			Methods and procedures	Professionalism & Ethics
			Governance	

Figure 3: The Association for Project Management Body of Knowledge as depicted in Morris et al. (2006).

3.3 FAC-PPM

The FAC-PPM was created by the United States Office of Federal Procurement Policy in April of 2007. The official memorandum announcing the creation of this certification stated only broad reasoning for its creation, such as the criticality of "well-trained and experienced program and project managers" (Denett, 2007). However, it is likely that pressure to reduce politically unsavory project failure rates played a contributing role. Although government-sponsored projects were among the first to adopt formal project management, the government itself has only recently begun applying these principles (Kerzner, 2010).

FAC-PPM contains three levels of certification: Entry Level, Mid-Level/Journeyman, and Senior/Expert Level (Denett, 2007). As with the PRINCE2 certification levels, this study assumes that the middle level is most apt for comparison to

the PMP. General use of "FAC-PPM" should be understood to mean the FAC-PPM Mid-Level/Journeyman certification for the remainder of this paper.

FAC-PPM is not explicitly based on a defined body of knowledge. It requires no academic degree, but does require coursework in the following areas: project management (24 hours minimum), interpersonal skills (16 hours minimum), government-specific policies and practices (24 hours minimum), and cost/value estimation (24 hours minimum). In addition to the aforementioned training, a minimum of two years of project management experience is required (Denett, 2007). There is no evidence of a centralized certification exam, but since each agency's Chief Acquisition Officer is responsible for implementing the program within the agency (Denett, 2007), it is possible that some agencies have an exam. There is evidence that the Veterans' Administration has an exam in order to obtain certification (Weinstein, 2012). Continuing education credits are required in order to keep the certification valid (Denett, 2007).

3.4 Comparison

Gilley and Galbraith (1988) suggested twelve characteristics that an ideal professional certification in adult education should have. Because none of the characteristics are specific to that field, Gilley and Galbraith's list will be used for the comparison in Table 1. Table 2 compares the qualification criteria presented in the above sections.

	PMP	PRINCE2	FAC-PPM
Administration of certification independent of parent association	NO	NO	NO
Program financially supported by parent association	YES	YES	YES
Effort to increase/advance competencies	YES	YES	YES
Actively marketed and promoted to the field	YES	YES	internal-only
No grandfathering	YES	YES	YES
Have legal counsel when developing and implementing certification	unknown	unknown	unknown
Formal examination	YES	YES	varies
Established recertification process	YES	NO	YES
Require continuing education	YES	NO	YES
Procedures for reevaluating certification status	NO	NO	NO
Written code of ethics	YES	NO	NO
Certification fee	YES	YES	NO

Table 1: A comparison of PMP, PRINCE2, and FAC-PPM against the certification characteristics identified by Gilley and Galbraith (1988).

	PMP	PRINCE2	FAC-PPM
Education	high school diploma	none	none
Training	none	2-day course	88 hours
Lower certification	no	yes	no
Experience	5 years (3 years with bachelor's degree)	none	2 years
Exam	yes	yes	varies
Renwal period	5 years	none	2 years

Table 2: Qualification criteria for project managment certifications.

Despite the project failures cited as an example in the introduction, it may be too soon to indict the FAC-PPM effort as a failure. The implementation timeline is unclear, but given the amount of work required to develop an internal certification, it is reasonable to expect that results would not be reaped immediately. Unfortunately, the federal IT dashboard (www.itdashboard.gov) shows no improvement in project success rates from 2009-2012. In fact, schedule performance appears to be on a trend toward greater failure, as shown in Figure 4.

Participants in the Veteran's Affairs Acquisition Agency's FAC-PPM efforts have overwhelmingly indicated that their knowledge has increased and many report seeing positive impact on project targets (Weinstein, 2012). Given that no research has shown a relationship between certifications and project success, FAC-PPM cannot be judged to be a failure. However, not failing does not necessarily mean success. FAC-PPM fares poorly against the PMP (but evenly with PRINCE2) on the characteristics proposed by Gilley and Galbraith. Nearly six years after FAC-PPM was first announced, the Office of Federal Procurement Policy should assess the value realized from the program.

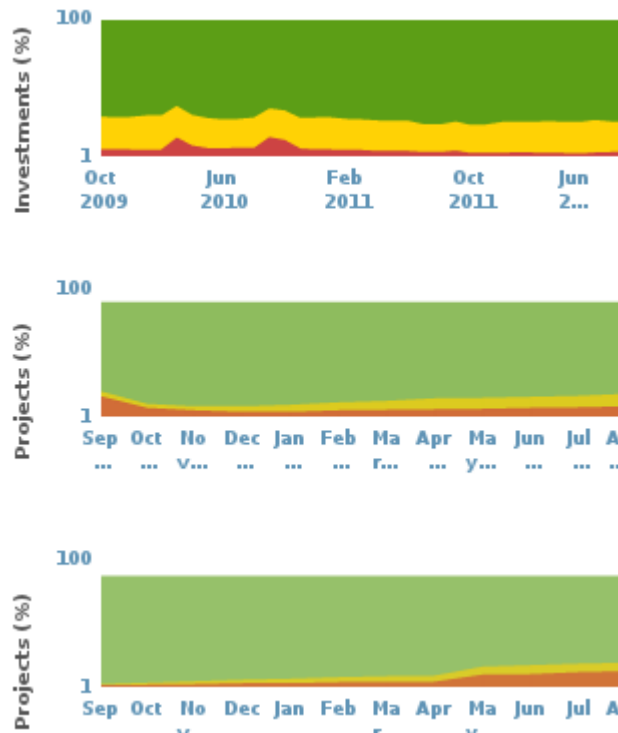


Figure 4: Federal IT dashboard trends from October 2009 to June 2012. From top: rating by agency CIO, cost performance, and schedule performance. Green represents low or moderately low risk. Yellow represents medium risk. Red represents moderately high or high risk. Image from <http://www.itdashboard.gov/portfolios>

4 Recommendations

Project managers often learn on the job, usually after taking their first formal project management position (Carbone & Gholston, 2004). New project managers many times are selected based on their performance in technical roles, not on the skills applicable to project management (McHugh & Hogan, 2009). There is obviously room to improve the intake of growth for project managers, not just in the government sector.

4.1 Organizational Certifications

It is tempting for an organization to collect current standards and package them into training material for new and early-career project managers. This may yield improvement, as over 70% of project managers report no annual training is required and 85% report "none-to-minimal" in-house training is available (Carbone & Gholston, 2004). McHugh and Hogan (2009) noted that if good project management practices are being followed, certification may not add much value. Training, and more importantly mentoring (Carbone & Gholston, 2004) and development of a career model (Bredin & Söderlund, 2012) can improve employee morale even if there is no direct impact on project success rates.

Based on the research presented here, I recommend that organizations refrain from developing their own certifications. If certification for project managers is desired, third-party certifications should be leveraged. Organization-specific material can be added as training as needed. Fostering a community of practice, with regular meetings, book clubs, or other knowledge-sharing activities (Kerzner, 2010) may ultimately prove more impactful and less expensive.

4.2 Educational Curriculum

Educators who wish to help their students get a head start on project management careers may be tempted to incorporate certifications into the curriculum. There is a precedent for bi-directional relationships between academia and industry certifications. Pima (Arizona) Community College offers students credit for certifications provided they pass an exam developed by the College and Regents College offers a bachelor's degree for 60 hours of course work plus credit-by-certification (Adelman, 2000). Some secondary and post-secondary institutions offer certifications as part of course curriculum (Randall & Zirkle, 2005), however none of these programs are specific to project management.

Randall and Zirkle (2005) suggests avoiding making certification too large a focus in curriculum, since changes in the field may require significant effort. ? (?) notes that certifications may be considered too vocational for many universities. That does not mean that there is no role for the university in project management certification.

University faculty and graduate students should perform research to verify the quality and applicability of practices being used (Morris et al., 2006). Curricula should be aligned with the PMBOK and provide ample opportunity for students to practice applying project management principles (Carbone & Gholston, 2004). Because universities control the education process, they exercise considerable influence on the development of entry barriers related to education (Morris et al., 2006).

It does not seem reasonable for a university curriculum to be designed around any project management certification. However, because the PMBOK (or other body of knowledge) should serve as a guide for course design, it is not necessary to ignore certifications entirely. If a university can arrange on-site testing for PMI's CAPM exam at a rate lower than the standard examination rate, providing that exam to interested students at the conclusion of a graduate-level project management course could prove beneficial to students.

5 Future Work

Given the small number of works investigating the impact of certification on project success, the issue merits further study. The FAC-PPM, as a taxpayer-funded program, especially merits a detailed study of its merits. I also suggest a study that administers the CAPM exam for randomly-selected students at the end of a project management course to see if it has any effect on the students subsequent employment prospects, early-career pay, and early project success rates.

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