The Impact of Continuing Education on the Performance of Project Managers [1]

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Abstract

The concept of the half-life of information and scientific facts brings us to the conclusion that, for the professional project manager, becoming a lifelong learner is imperative. The exponential advances and proliferation of technology only make the problem appear faster. There are many learning approaches to lifelong learning that a project manager can adopt. Selecting the most effective approach to learning depends on the project manager's self-knowledge as much as an awareness of what is available. Soft skills are paramount, though difficult to teach and learn. A closer match between education and practice is needed, thus requiring education systems to keep pace with the demands in the field. While organizations have found success in bringing ongoing education to their project management teams, academic research in the area lacks the fullness of other, more studied topics. This examination of existing literature notes limitations in current research, but bright points for the project management lifelong learner.

Introduction

In 2012, Samuel Arbesman published "The Half-Life of Facts: Why Everything We Know Has an Expiration Date." There he established from a scientometric perspective that facts or information grow stale and become obsolete, much like radioactive particles decay. Coupling that concept with Moore's Law, which impacts the Internet, airplanes and dishwashers (Mack, 2015), and the march of progress seen between versions of PMI's PMBOK (PMI, 2008; PMI, 2013b; PMI, 2017a), leads to the conclusion that project managers in every field and around the world have difficulty keeping up with the information, tools, and techniques they need to do their jobs competently and confidently.

This literature review considers these ideas and seeks to answer the following questions:

1. What is the half-life of the knowledge owned by project managers?
2. What lifelong learning approaches should project managers consider?
3. What skills should project managers seek to learn and maintain?
4. Does a lifelong learning approach to professional project manager development have a positive impact on the project managers' organizations?

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What is the half-life of the knowledge possessed by project managers?

Arbesman (2012) examined studies conducted on various arenas of knowledge and discovered that over centuries, different arenas see a doubling of knowledge at different rates. This doubling, and the resulting replacement of outmoded facts and concepts with those newly discovered or devised, is what Arbesman calls a "half-life." These rates were measured by noting the number of contributions in each field. In a 1947 study, Mathematics saw a doubling in 63 years, whereas Chemistry saw a doubling in 35 years (Lehman, cited in Arbesman, 2012, p. 14). A 2008 study measured the half-life of scholarly books published in various fields; here Physics had a half-life of 13.07 years, and Math had a half-life of 9.17 years (Tang, cited in Arbesman, 2012, p. 14).

The Project Management Institute is a driving force behind project management methodologies throughout the world.

> Every three to four years, the Project Management Institute publishes an updated Guide to the Project Management Body of Knowledge (PMBOK Guide) (PMI, 2008; PMI, 2013b; PMI, 2017a). These guides form the basis for project management methodologies throughout the world and in every industry. These publications further serve to document the baseline information every Project Management Professional (PMP®) certification candidate must know and master to pass the rigorous PMP® certification exam. At a high level, we can say that this knowledge has a half-life of approximately three to four years (Kopischke, 2018, pp. 6-7).

Knowing that all information or knowledge has a half-life leads to the conclusion that every worker must contend with the expiration of their knowledge.

In 1965, Gordon Moore published the results of a study where he concluded the number of components on an integrated circuit would double every year for ten years (Mack, 2015). This understanding has been expanded to a more general idea that computer chips will continue to get "denser and denser for decades while keeping the cost per area the same and reducing the cost per transistor" (Mack, 2015, p. 36). Technology has a half-life, inevitably presaging newer inventions, newer technologies and, subsequently, more knowledge subject to expiration.

Hutchins (2011) brought this conveniently into focus for the purposes of this literature review, tying Moore's Law to one's information technology career by informing the reader that Moore's Law impacts technology careers, and information technology professionals ought to spend ten hours each week "learning new technologies and keeping current in their profession" (Hutchins, 2011, p. 58). If knowledge and careers are subject to the half-life concept, workers must concern themselves with taking steps to maintain their viability as employees.

Over the past few decades, the idea that knowledge is not immutable has become mainstream. What project management professionals know to be true changes as the field advances. Technology continues its uninterrupted progress into the future.

What lifelong learning approaches should these project managers consider?

The argument for a team approach to project manager learning environments was made by Kasten (2014). Kasten reasoned that working with project teams can be one of the most complex elements of project management practice and that a project management learning environment should reflect this complexity, while cautioning that project management instructors must also allow for the inclusion of appropriate "uncertainty and political activity" (p. 106) and that students might not properly appreciate such ambiguity. Emphasizing project teams via classroom teams is a fine idea on the surface, but this author has found limited use of the team concept in practice at the graduate level. The great variety of project management and academic experience of all team members does render uncertainty, but that purpose of the course can overwhelm the subject matter.

Wateridge (1992) suggested that, to combat the problem of good project managers delivering subpar project outcomes, project managers should seek new skills or perspectives on existing skills through "experiential learning" (p. 285), concluding that because "85% of all skill developments are derived from experience" (p. 285), this learning approach is the most viable, while cautioning that skills learned through experience are time-consuming to accumulate. Wateridge added that traditional forms of education, such as "reading, seminars/workshops, and schooling" (p. 285) are excellent supplemental learning approaches. Wateridge also cited Thamhain and insisted that project managers ought to become lifelong learners. Wateridge felt that a combined multiplicity of learning approaches together creates the best environment for project managers to enhance the skills necessary to succeed. This was echoed by the Project Management Institute (PMI, 2017b) in discussing how an individual's pace and style of learning, understanding of learning approach types, and familiarity of teaching techniques all impact which kind of learning approach is going to be the most efficacious.

Berggren and Söderlund (2008) brought Mode 2 societies into the conversation, linking project management skill sets to these concepts. Salomon (2001) reminded the reader that Mode 2 societies are those where science emerges from academia into the world beyond classrooms and research labs with "the development of knowledge within a particular social context" (p. 585), including more inputs to the development of new technical and scientific ideas than just academic researchers. Project managers must become participants in the creation of the very knowledge they require to remain employable for the long term.

Edmonds (2010) noted that "[e]ffective project management training needs to emphasize structure [,] … creativity [, and] … flexibility" (p. 316). However, Edmonds does not further illuminate what kind of learning approach would be appropriate to deliver these, rending this advice difficult to assess and more difficult to apply.

Situated learning, or on-the-job training, has long been seen as an effective means of increasing work knowledge and capability. Stein (2001) questioned that wisdom, noting that frequently the evidence is only anecdotal or even just wished-for, while also proposing that situated learning can be a powerful connector "[w]hen combining working and learning in the same location" (p. 422). Situated learning will always be seen as an important part of employee knowledge-building.

Mogk and Grau (2014) focused on e-learning as their preferred learning approach for project managers, drilling into how to make that learning approach maximally effective and successful, narrowing their study to a single e-learning environment ("Moodle") then in use at the institution serving as the locus of their work, a regional university in Germany. Mogk and Grau cited maintaining and increasing motivation as a vital factor in the success of the e-learning environment as the project management students used it. E-learning can be an important tool for the lifelong project management learner.

Ramazani and Jergeas (2015) repeated that fissures between project objectives and project performance abound, even with increased spending by organizations pursuing improved project performance. Ramazani and Jergeas identified a multifaceted problem – a lack of proof that more-educated project managers perform better, unfocused training in the hopes that new information presented to project managers can be used to generate great ideas, and that methodologies developed by PMOs may not be the silver bullet they were intended. However, Ramazani and Jergeas reported reason for hope and advocated a long-term focus on training that includes coaching and mentoring, while emphasizing that "new and nontraditional ways of thinking" (p. 51) is needed. Such research supports known concepts like coaching and mentoring but leaves unanswered what new approaches might be found.

According to Savelsbergh, Havermans and Storm (2016), large portions of lifelong learning occur beyond traditional learning environments. One challenge here is that we don't always know when we have learned something useful. The concept of implicit learning tells us that we learn in ways that are unplanned, unintentional and without any awareness of learning (Eraut, 2000). If lifelong learning is something sought by individuals and organizations alike, efforts must be made to identify learning wherever, whenever it takes place, whether a learning activity was planned or not. For organizations interested in publicly touting their commitment to employee education and for those employees interested in receiving credit for such educational endeavors, clear identification is important.

In 2008, Alam, Gale, Brown and Kidd acknowledged that organizations and individuals insist that project management education and training must reflect a return on investment, while determining that such a return is difficult to measure. Their study also identified the need to identify the influence of training as distinct from other factors, especially since all of the factors in question – "[project management] training, education, … marketing, management attention, changes in procedures, adjustment in standards, interest rates, economic and political stability" (pp. 226-227) – can impact organizational financial performance, reflecting concomitant project performance. In pursuit of a solution to this, Alam, et al. argued that a properly framed lifelong

learning program – a "Project Management Professional Development Programme" (p. 224) could provide the measures sought by individuals and organizations providing the funding for such education. The researchers pulled together a study that included academic input from the University of Manchester and industry input from a Rolls-Royce consortium. This approach to training the project managers included modules, materials, objectives and learning points, folding into this an assessment of competence, while emphasizing that the program was not complicated. The researchers concluded that their program produced significant, positive results for the students who completed the program. A properly focused and developed program intended for project management lifelong learners can bear the kind of fruit sought by those paying for the ongoing education.

PMI (PMI, 2017b) released its own study into competency, intending to "provide a framework for the definition, assessment, and development of … project manager competence" (p. 1). This delineated a variety of competencies seen to have a positive effect on project success. PMI directed its concentration on a project manager's knowledge, performance, and personal competencies, arguing that mastery in each of these can be observed and measured, with maximal values of measurement in each of the areas indicative "of a fully competent … project manager," (p. 3). The knowledge facet is defined by PMI within many of its publications, so PMI felt it was not necessary to discuss this aspect within the referenced study. Performance competence was determined by how project managers use knowledge to manage projects. Personal behavior competence is also defined by what a project manager does though, in this case, filtered through "behaviors, attitudes and core personality characteristics" (PMI, 2017b, p. 35). PMI prescribed a four-step method for achieving competence as a project manager:

1. "Review [r]equirements" (p. 31) to determine and combine the needs of the project manager and the project manager's employer.
2. "Assess [c]ompetencies" (p. 31) to understand the level of competence of the project manager.
3. "Prepare [a c]ompetency [d]evelopment [p]lan" (p. 31) to address any shortcomings seen in the project manager's performance.
4. "Implement [the c]ompetency [d]evelopment [p]lan" (p. 31) defined in Step 3.

PMI (PMI, 2015) also reported that the Canadian Department of National Defence sought to implement project management training to institute "competence-based management[,] … [a] link between project management competency and project complexity and risk[,] [a] standard for project management competency[, and] a program to generate and maintain project managers qualified at accepted competency levels" (p. 3). This focus on competence and competency within their training goals showed an interest in revealing the value project management brings to organizations managing work through projects.

The classroom approach to lifelong learning is also an option for project managers, in colleges or universities at the undergraduate or graduate level, through commercial seminars and professional conferences. These options maintain their appeal because they are effective approaches to learning, they bring value to the learners and, in many cases, their sponsoring

organizations, not to mention the rest of the world, as ongoing research by post-graduate scholars continues.

Project managers seeking to become lifelong learners have never had such a wide variety of learning approaches available to them. Traditional classrooms, newly formulated educational programs, teaming with others in the learning environment, experiential learning, outcome-based learning, situated learning and e-learning are all common methods available to today's lifelong learner. Project managers will want to take stock of the many offerings and engage with those most suitable to their own learning styles, to maximize utility within the learning experience. Lifelong learners in the project management field do well to remember that coaching and mentoring are also powerful learning approaches.

What skills should project managers seek to learn and maintain?

Kasten (2014) argued that project managers use different methods on the job than they are taught to use in the classroom and that this discrepancy must be eliminated. Of particular note is Kasten's assertion that project managers must master interpersonal as well as technical skills. This focus on the less technical aspects of performance is seen as critical in many working environments.

Leadership is widely believed to be a key tool in a project manager's kit. Leadership competency, in all its complexity, was posited by Bolden and Gosling (2006) as an "illusory promise to rationalize and simplify the process of … developing leaders" (p. 147), but those authors further argued that while "competencies offer … a sense of structure and consistency" (p. 148), they insisted that very structure can forestall researchers from digging into the matter further. The authors also noted that there is a significant distance between the performance of leaders and what the literature tells us about what competency should deliver in the field. This should give us pause when considering focusing on competency topics for lifelong project management learners.

Thomas and Mengel (2008) insisted on the topic of complexity theory as a key study area for project management lifelong learners, and determined that complexity theory can help project managers address project issues and schedules, for this theory concentrates on "the two zones in which a disturbed system may return to: a stable zone and an unstable zone" (p. 307). We can equate the two zones in project management thus: the stable zone is that in which the project team is performing within the project baselines; an unstable zone is one in which the project team is performing outside of those baselines and change orders are required. Clearly, a project manager will want to keep the project in the stable zone and remember that complexity theory can offer a course of study that may lead to more desirable project outcomes.

According to Aronson, Shenhar and Patanakul (2013), "project spirit" (p. 35) is a critical component to project success and this spirit is built upon the "project vision, leader values, and artifacts implemented by the leader" (p. 36). A project manager's vision can clarify his or her values. Communicating these to the project team members creates for the team members what

the researchers call "artifacts," those common activities and approaches to project work that lead teams into more cohesive means of working together. A more cohesive team will work together better and produce positive and more consistent project results. By seeking to educate themselves in delivering vision and values to their project teams, project management lifelong learners can bring about higher project performance outcomes.

El-Sabaa (2001) differentiated the roles of functional manager and project manager to identify the skills required by an effective project manager, focusing on interpersonal relationship skills, developing an understanding of the organization(s) surrounding the project manager and their project, and subject matter knowledge, giving the project manager important insights into the work project team members perform in pursuit of project goals and objectives. El-Sabaa's study determined that the most important skill of the three areas is that surrounding interpersonal relationships. Lifelong project management learners will need to focus on the interpersonal skills they require to successfully interact with others during the pursuit of a project's goals and objectives.

Benoy and Gracias (2015) identified four specific skills they deem required by a proficient project manager –

1. "Task accomplishment
2. Decision making
3. Leadership skills, emotional skills
4. Teamwork" (p. 74)

Benoy and Gracias also noted a shortage of project managers and a need to, therefore, create a development funnel, directing potential project managers into organizations where they are needed. From this, we can conclude that project managers need to focus their continuing efforts on softer skills when seeking lifelong learning opportunities.

Of the most prominent issues identified the Office of Government Commerce and cited by Edmonds in 2010, the "[l]ack of skills" (p. 315) ranks as the fourth most common. Edmonds' training focus, however, was on project management methodology, not skills development, making the identification of which skills a project management lifelong learner should seek to learn and maintain impossible. Edmonds seems to want to help but offers little of substance to the reader interested in pursuing that train of thought.

In October 2018, The Project Management Institute (PMI) reported 887,937 active holders of the PMP® (Project Management Professional) certification (PMI, 2018), each after a rigorous exam and complex application process. Consequently, PMI has a reputational and financial interest in furthering the skills development of those who wish to earn and maintain the PMP® certification. PMI (2013b) introduced a revised paradigm for the categorization of Professional Development Units (PDUs) which are the standard measure of time one spends learning in order to maintain one's PMP® certification. This new paradigm requires that PMP® certification holders actively gain new knowledge in three skill areas: technical skills, leadership skills, and

strategic and business management skills. It is important to note that this triumvirate represents hard skills (technical skills), soft skills (leadership skills) and management skills, reflecting PMI's seeming interest in professional project managers possessing many of the skills necessary to lead not just projects, but organizations.

The skills a project management lifelong learner needs to maintain and enhance over a career include not just project management-specific knowledge and tools. Project managers must master interpersonal skills, grapple with complexity theory, perfect those skills necessary to be organizational leaders, and create a project environment conducive to better teamwork, all in pursuit of meeting project objectives and making decisions. It is critical to identify the interpersonal skills as those frequently referred to as soft skills, and, as Hadad, Keren and Laslo noted, these are notoriously difficult to teach (as cited in Benoy & Gracias, 2015).

Does a lifelong learning approach to professional project manager development have a positive impact on the project managers' organizations?

Thomas and Mullaly reported that enhanced value in project performance resulting from organizational expenditures targeted at ameliorating insufficient project performance has been not only difficult to quantify but difficult to even characterize (as cited in Fernandes, Ward and Araújo, 2014). Fernandes, Ward and Araújo yet identified multiple means to improve project management, key among those being project management training. However, given the broad nature of the study referenced here, it is not possible to work out how much, or if at all, project management training positively impacted the organizations' project management performance.

In project-based organizations, one would expect the measurement of project performance and project manager performance to be more fully realized. Wickramasinghe and Liyanage (2013) sought to tie such performance to "high performance work practices (HPWPs)" (p. 64), and indeed, they discovered support for such a connection. Importantly, one of the three HPWPs studied included the training and growth of the participants. Wickramasinghe and Liyanage, amid a noted dearth of studies in this area, still found statistical validation to identify a connection between ongoing training and HPWPs. While more research is called for, it still can be argued that lifelong learning can bring improved project management performance to organizations willing to take that step.

"NASA knows that project management education is essential to its success" (PMI, n.d., p. 1). However, NASA did not always behave in a way that supported this conclusion, for it was not until 1988 that NASA started its project management training program when it created its Academy of Program/Project & Engineering Leadership (APPEL). However, NASA has since been able to point to the positive impacts of a trained project management coterie, such as an increased efficacy in the delivery of the outcomes of complex projects, the drawing in of individuals seeking to become project managers and the rising success of programs and projects. While most organizations will not have the capital or political will to create an academy capable of delivering NASA's more than 65 courses endorsed by PMI for "Professional Development Unit

(PDU) credit and contact hours" (p. 2), NASA has shown that such an approach can indeed provide a path toward positive impact.

IBM took an approach similar to NASA's when it created its "Project Management Center of Excellence (PMCOE)" (Boland and Stefanazzi, 2018, p. 1), intending to provide project managers with ongoing education through a course of study that has a goal of creating a dependable level of project management performance company-wide, and ultimately providing executive-level candidates for promotion. By tapping into PMI's PMP® certification as a lodestone for the focus of their program, IBM developed an internal certification program that "allows employees to grow from an entry level to an executive management position" (p. 4). At the time of the report, the PMCOE had already been in existence for 16 years, providing a solid foundation for the claim that IBM's approach is producing desired results.

Nijhuis (2015) attempted to divine a believed improvement in project management performance from before, during and then after education. The preliminary results of the study seem to indicate no statistical support overall for an improvement in performance, but it is important to recognize the study was performed on students self-reporting. Nijhuis' results are inconclusive and no following research findings were uncovered.

Leadership and other soft skills are promoted for the project management lifelong learner. Complexity theory also offers a potential course of study. While PMI promotes the subject matter areas PMP® certification holders must continue to study (technical skills, leadership skills, and business management skills), even PMI does not prescribe much in the way of which specific skills are most useful to a project manager seeking to maintain or enhance their career. Studies are too broad, incomplete, or inconclusive. Individual organizations seem to have better results in determining just what a project manager needs to learn to guide projects to successful completion and progress in their career, but these are not likely to be recipes that can easily be transferred to other organizations. Indeed, these organizations which have produced these results might not be interested in the sharing the details of their successful programs with competitors or other organizations gratis.

Conclusion

Even the most factual, scientific information can become obsolete because of research or invention, and is often driven through the advancements in technology or innovation in the field. To remain competitive and effective, project managers should then aspire to become lifelong learners, seeking out a variety of learning opportunities and approaches that resonate with them best, to refine current skills and acquire new skills. Of particular criticality are soft skills that demonstrate leadership prowess and an ability to manage within changing operational ecosystems. General research is thin, but some organizations have found significant success by providing project managers with ongoing training. While more research is needed, becoming a lifelong learner is an excellent position for every project manager seeking to play a role in the field for many years to come.

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