

LEARNING HOW TO MANAGE PROJECTS: EXPLORING THE SITUATIONAL CONTEXT

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INTRODUCTION

This paper presents an account of how project management practitioners learn, how they determine what they want to learn, and suggests some future directions for their knowledge journey. Two similar teaching approaches will be discussed that are currently used at undergraduate and post graduate level in an Australian University. The approaches used to embed the formal concepts taught in class include field work and reflective practice. This will provide a view of the formal structure in which learning takes place and the informal way that explicit knowledge is converted to tacit knowledge. A formative research study into project management research directions undertaken in 2003 provides a framework for the knowledge required by practitioners to further the discipline of project management.

HOW DO WE LEARN?

Every project teaches a project manager something. It is the product or outcome of that teaching that provides the student with the appropriate knowledge to apply effectively in the future. Through placing the learner in a structured situation the teacher can observe and both can reflect on the application of the lessons learnt. Thus can happen prior to, during and after the learning opportunity has been undertaken. Two approaches will be explored as to how these situations are created: the external observer model, such as field work and the internal observer model which can be structured through reflective practice. This exploration shows the difference between the attainment of explicit knowledge that is 'expressed in formal and systematic language and shared in the form of data, scientific formulae, specifications, manuals' to tacit knowledge that is 'deeply rooted in action, procedures, routines, commitment, ideals, values and emotions' (Nonaka, Toyama and Konno, 2000).

Situated Learning

Teaching explicit concepts and theories in a formal class-room environment takes the practice of project management out of context. To provide the appropriate environment to embed knowledge, learning can be 'situated' where unintentional learning can be the outcome of a process called 'legitimate peripheral participation (Lave, 1990). This environment can be formally structured to teach students and observe their responses to a variety of situational contexts (Edmondson and McManus, 2007). The process to undertake collaborative field studies is two-fold: firstly a 'student' needs to be placed in a situation and secondly, they then need to be observed so appropriate data can be gathered to assess their capability.

To begin the field placement, the teacher needs to ensure that appropriate agreements are in place for the student and the place of work, learning tools need to be identified and approaches

discussed and the place of work needs be appropriate for the learning outcomes. Challenging issues can present themselves if the student and the teacher are not prepared for the 'learning blocks' listed below (Megginson and Boydell, 1989):

- Perceptual – students cannot see or recognise the nature of the learning required
- Cultural – students rigidly adhere to a set of norms that define what is good or bad
- Emotional – the emotional state of students affects their ability to learn
- Intellectual – students may not have the intellectual skills necessary to complete a task

When studying in the field, the teacher and student need to understand their responsibilities, both legally and ethically. There is a duty of care for both parties and importantly for those also working in the field, such as the client and colleagues. The teacher also needs to be aware of specific issues such as: game playing where covert agendas are being followed; mirroring where the student is unable to emotionally manage the situation and consequently transfers responsibility or ownership, consciously or subconsciously; not meeting learning needs and managing conflict. These can all be managed through the appropriate preparation and early detection with strategies ready to use so these issues can be resolved accordingly.

To observe the student in the field, the teacher may act as an ethnographer to get close to the activities of the student. The ethnographic approach will assist in this observation by allowing the teacher to study the apprentice practitioners as they go about delivering projects in a structured and supportive environment. The two activities the ethnographer will undertake in the field include 'participant-observation' through entering the social setting of the students and then taking systematic field notes. This discipline of field research is described by Sankaran (2009) as having three modes: Mature, where a quantitative study is undertaken by asking questions related to existing constructs; Nascent, where qualitative techniques are used such as open-ended questions centred around specific phenomenon and Intermediate, which combines both Mature and Nascent techniques to identify the relationships between new and existing constructs.

Reflective Practice

The student, having collaborated in a situational context, can further embed their knowledge through individual reflection. The exploration of how the self has interacted and reacted under certain circumstances can illuminate future pathways not previously considered. This process is often ignored in practice in the quest to deliver outcomes in the ever changing and busy environment of managing projects. A reflective practice that has been used throughout the history of mankind is story telling. This is the process where a problem or conflict can be addressed, ideally in writing, that will result in a lesson has being learned. A published set of project management 'success' stories by Laufer and Hoffman raised the profile of passing on tacit knowledge through three slightly different perspectives: successful stories, 'mistake' stories and those that started as failures to then be closed successfully. Further exploration of the 'strategic narrative' has been observed to 'clarify thinking, capture the imagination, and excite and energise people' (Laufer and Hoffman 2005).

In the 'Re-thinking Project Management' study, Winter et al. (2006) presented project management practitioners as reflective technicians who were capable of approaching complex projects reflectively while also pragmatically applying theory in practice. The successful outcome of projects was linked to a practitioners' ability to conceptualise projects from different

perspectives, read situations, establish the problem, deal with ambiguity, relate to wider issues and be politically astute. This required the project manager to possess qualities of reflection-in-action and leadership.

The ‘Re-thinking’ study drew on Schön’s early observation that ‘research functions not as a distraction from practice but as a development of it’ (Schön 1983, p ix). The key *constants* of a reflective practitioner according to Schön in 1987 are compared for continuity to the framework introduced by Dewey in 1917, in Table 1 below.

Dewey (1917)	Schön (1987)
<ul style="list-style-type: none"> • A genuine situation of experience 	<ul style="list-style-type: none"> • The media, languages, and repertoires that practitioners use to describe reality and conduct experiments
<ul style="list-style-type: none"> • A genuine problem in that situation 	<ul style="list-style-type: none"> • The appreciative systems they bring to problem setting, to the evaluation of inquiry, and to reflective conversation
<ul style="list-style-type: none"> • Opportunity and occasion to test ideas by application, to make the meaning clear and discover for self their validity 	<ul style="list-style-type: none"> • The overarching theories by which they make sense of phenomena
<ul style="list-style-type: none"> • Information and observation about the situation • Suggested solutions for which the learner will be responsible 	<ul style="list-style-type: none"> • The role frames within which they set their tasks and through which they bound their institutional settings

Table 1: The Essentials of Reflective Practice

An extension to the ‘Re-thinking’ study proposed that the level of expertise, competence and knowledge in project work and management was linked to the reflective capability of the practitioner. The *Proficient Performer* was noted as possessing ‘reflective understanding and participation in power relations’ and the *Expert or Virtuoso* exhibited ‘participative critical reflection over the intuition – the self and the group’ (Cicmil et al. 2006).

The role that education plays in reflective practice is essential in setting a framework for practitioners. *Professional artistry* or ‘competency practitioners display in unique, uncertain, and conflicted situations in practice’ (Schön, 1987) relies on the ability of the practitioner to recognise, judge and then deliver, which is also referred to as *reflection-in-action*. The practitioner needs to demonstrate their ability to explicitly divulge the tacit knowledge they possess whilst knowing the static facts, procedures, rules and theories. They can then adjust and make necessary corrections to be able to perform, referred to as *knowing-in-action*. How do practitioners develop reflection-in-action depends on how they review an unexpected outcome after following a known course of action. The practitioner may stop after the event and reflect or stop during the event and take corrective action, with the reflection being unconnected to the anticipated outcome. In the learning environment, establishing a setting that simulates the work-place environment provides students with ‘a setting designed for the task of learning a practice’ (Schön, 1987). Essential to learning in this environment is the requirement to establish protocols, an ability to frame the problem and provide a space to undertake immediate reflection.

The ability to transfer knowledge requires some form of control which both students and teachers are bound by in the traditional sense of delivering and testing knowledge (Schön, 1983). The monitoring and rewarding of both the student and the teacher can thwart the ability to incorporate reflective practice into the curriculum. In addition, the ability to reflect on the research being undertaken that continually directs future knowledge attainment requires serious consideration, as noted in some of the recommendations of the 'Re-thinking' study. Lastly, we may need to consider how and when to reflect on the practice of reflection so we can constructively add to the considerable body of knowledge in this area.

Application in Higher Education

To ensure that knowledge attainment is structured and lessons are learnt, students enrolled in project management subjects at the University of Technology in Sydney are being asked to participate collaboratively and then reflect individually on the lessons learnt. This form of *cognitive apprenticeship* 'supports learning in a domain by enabling students to acquire, develop and use cognitive tools in authentic domain activity' (Brown, Collins and Duguid, 1989). It also allows students to learn within boundaries that are 'firmly set by the task, culture and history of the community' (Nonaka, Toyama and Konno, 2000).

Students undertaking undergraduate and post graduate project management studies are exposed to two different learning environments. Both classes require students to possess a foundational level of knowledge learnt in previous subjects before they can apply the theory into a practical situation. Students are monitored and supported by the lecturer and are required to submit assessable outcomes that meet both the learning objectives of the subject and the project 'client's' expectations.

At the undergraduate level, students in their third year of a full-time Bachelor of Construction are tasked with designing and constructing a residential project *in situ*. The project involves the student working collaboratively in a project team to plan and construct a residential building in a disadvantaged community either within Australia or outside Australia. The subject includes instruction on both the customs and culture of the relevant community and the construction methods relevant to that community. Theory and the practical application on-site provide the student with the opportunity to experience how the theory and concepts taught in class can be applied in a real-life situation. Assessment of the knowledge gained in this subject is through the preparation of a project plan, participation on-site and a Reflective Journal.

Students in their second year of a Masters in Project Management are required to identify an industry-based project and are required to deliver the project to the client's specifications within a semester. The project is based on interpretation of the learning objectives of the subject and the opportunities available in the selected work place. The submission and presentation of the work-place project is expected to take the form of a project plan and in some instances the project may also be implemented depending on the client's expectations. Students meet regularly with the lecturer to present industry standard progress reports on their project and keep a Reflective Journal, analysing their experience as evidence of learning. Students are also expected to demonstrate collaborative capability by providing feedback to the cohort on their projects after students have presented their regular progress reports. Their feedback is placed in an online forum with a specified and assessable level of contribution and interaction to ensure each student has the opportunity to provide and receive appropriate feedback.

Knowledge Creation Models

To solve problems project management practitioners are required to adapt to change by finding, retrieving and processing knowledge. To achieve successful outcomes, knowledge must be created and converted by these people in an often evolving and dynamic environment. Nonaka, Toyama and Konno (2000) have developed a 'Model of Dynamic Knowledge Creation' to define the knowledge creation process in terms of three elements:

1. The SECI process: the conversion between tacit and explicit knowledge through Socialisation, Externalisation, Combination and Internalisation.
2. *ba*: A place where knowledge sharing, creation and utilisation can be shared.
3. Knowledge Assets: The moderation of inputs and outputs to the knowledge creation process that can be defined as experiential, conceptual, systematic and routine.

Further exploration of the SECI process is required due to the relevance to this discourse. A practitioner converts explicit knowledge to tacit knowledge resulting in an anticipated expansion in the quantity and quality of knowledge. The four modes of this conversion are summarised below:

- Socialisation: conversion of new tacit knowledge through shared experiences, often in a shared environment where an apprentice can observe, interact and socialise often beyond the organisational boundaries.
- Externalisation: articulating tacit knowledge into explicit knowledge with others that will therefore create new knowledge.
- Combination: conversion of explicit knowledge to more detailed explicit knowledge through gathering data internally or externally and then shared within the organisation.
- Internalisation: taking the shared explicit knowledge and converting that into tacit knowledge by the individual.

The teaching approaches used in field work and reflective practice provide the student with the ability to convert information across all four of the SECI modes listed above. Undertaking field work in teams or through structured discussion provides the student with the opportunity to Socialise their experiences. The preparation and presentation of the assignment meets both the Combination and Externalisation requirements respectively when gathering and articulating data. Internalisation of the knowledge is undertaken through reflection which is structured in written form and submitted for assessment after the field work has been completed.

The transfer of knowledge is facilitated by the teacher who can take on the role of a mentor or coach, working with the student in what could appear to be an apprenticeship arrangement to develop and attain new skills. The teacher is a role model, a sounding board and a counsellor, supporting the development of his/her student sometimes outside the traditional manager-subordinate relationship. The relationship between a teacher and a student is dynamic and often evolves as the student becomes more competent. This process of reflection-in-action can become elliptical, 'using shorthand in word and gestures to convey ideas that to an outsider may seem complex or obscure' (Schön, 1987). The process of coaching a student involves telling and listening, demonstrating and imitating and ideally will proceed uninhibited in a supportive environment that prepares the student to enter the 'real' world armed with skills and knowledge that have been tested in a 'created' world.

WHAT DO WE WANT TO LEARN?

Research creates knowledge and the act of enquiry is the beginning of finding out what we want to know more about. To identify what project management practitioners want to know more about we undertake research. A formative study on the future directions of project management research was identified in the outcomes of the Engineering and Physical Sciences Research Council (EPSRC) funded project on ‘Rethinking Project Management’ (Winter et al. 2006). The study presented the concerns of project management practitioners in the areas of project complexity, social process, value creation, project conceptualisation and practitioner development. These formed the five key directions for future research in project management which are summarised in Appendix 1. The fifth direction that addresses ‘Theory *in* Practice’ detailed in Table 2 below sets the scene of how project management practitioners need to develop from trained to reflective practitioners.

Theory <i>in</i> Practice		Direction 5	
Practitioners as Trained Technicians		➡	Practitioners as Reflective Practitioners
From: training and development which produces: practitioners who can follow detailed procedures and techniques, prescribed by project management methods and tools, which embody some or all of the ideas and assumptions of the ‘from’ parts of 1 to 4.			Towards: learning and development which facilitates: the development of reflective practitioners who can learn, operate and adapt effectively in complex project environments, through experience, intuition and the pragmatic application of theory in practice.

Table 2: *Re-thinking Project Management as a Reflective Practice* (Winter et al. 2006, p. 642)

The journey of the technically proficient project manager to the reflective intuitive project practitioner according to the ‘Rethinking’ study was further developed in the work done by Cicmil et al. (2006). A progression from the *Novice* practitioner to the *Expert* is presented in Appendix 2 and details the level, experience and an outline of what the practitioner’s actions are based on, including some additional comments. The *Novice* bases success on learning the rules whereas the *Expert or Virtuoso* undertakes ‘participative critical reflection over the intuition’ of the self and the group. This provides a framework for the adaptive learning process that the ‘Rethinking’ study suggests is necessary for the development of the practice of project management.

FUTURE DIRECTIONS

The basis of current practice can be said to be the result of applying historical lessons learnt, with the future state then being directed by the failings of the current state through research. Schmidt, et al., (2001) identified that the lack of project management skills was ranked in the top five risks associated with Information Technology projects. To investigate this concern, further research was conducted by Du et al. (2004) into the project management material being taught to Information Technology undergraduates across 206 institutions in the US. The conclusions drawn from this study found that while the *hard* skills of managing a project, such as time, cost and quality, were being emphasised, there existed a need to incorporate the *soft* skills of managing a project such as organisational leadership and communications.

Trends in project management research (Sankaran, 2009) have confirmed this shift from the attainment of *hard* skills such as cost and schedule control, performance measurement, work breakdown structures and life cycle management in the 1970's to risk management, earned value, team building, quality management and the use of computers in project management in the 1980's. The more recent trends in project management research are in the development of the *soft* skills such as team building, leadership development and motivation.

This shift is also evident in the new Project Management Institute's (PMI) Project Management Body of Knowledge and the Australian Institute of Project Management (AIPM) Professional Competency Standards for Project Management, refer to Appendix 3. Both have codified an extension of the *soft* skills of project management with an emphasis on various components of the core knowledge areas of communications and human resource management. The fourth edition of the PMBoK® has further developed the process of managing a project with the greatest change being in the areas of stakeholder management and interpersonal skills. A summary of the emergence of the *soft* skills used to manage projects from an IT case study, research trends, a body of knowledge and a competency standard is represented in Table 3 below.

IT Case Study (Schmidt et al. 2001)	Research Trends (Sankaran 2009)	Body of Knowledge (PMI 2008)	Competency Standards (AIPM 2010)
Motivation Interpersonal relations Leadership Culture Resistance to change Communications Organisational relationships	Team building Leadership Development Motivation	Leadership Team building Motivation Communication Influencing Decision making Political and cultural awareness Negotiation	Leadership Engagement Self-control Assertiveness Relaxation Openness Creativity Result Oriented Efficiency Consultation Negotiation Conflict Reliability Values Ethics

Table 3: The Development of Soft Skills in Project Management

CONCLUSION

The ability of practitioners to enhance their understanding of the discipline of project management through skill development can deliver tangible benefits to their clients. To allow the practitioner to develop, they must become a student and work within a supportive environment to test their knowledge and gain lessons through the application of theory in real-life situations. Two examples of learning approaches were presented to demonstrate the way in which an Australian university provides this learning opportunity to the student. With the support of the lecturer, the student can convert their tacit knowledge to explicit knowledge and further develop

this explicit knowledge for the benefit of their personal learning journey. This has flow-on effects for the discipline of project management when we see shifting research agendas and teaching curriculum reflect the ever changing needs of knowledge attainment. What triggers these changes can be debated – the individual, the organisation, industry associations or society. What we do know is that through active reflection, the practitioner will have the opportunity to evolve and in so doing will be able to demonstrate that project management can also meet the challenges of this continually changing environment.

'The alternative to furnishing ready-made subject matter and listening to the accuracy with which it is reproduced is not quiescence, but participation, sharing in an activity. In such shared activity the teacher is the learner, and the learner is, without knowing it, the teacher'

(Dewey 1916, p.110)

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APPENDICES

Appendix 1: Re-thinking Project Management – the five directions (Winter et al. 2006, pp 642)

Theory *ABOUT* Practice

Direction 1

The life-cycle model of projects and PM	➡	Theories of the complexity of projects and PM
From: the simple lifecycle-based models of projects, as the dominant model of projects and project management. And from: the (often unexamined) assumption that the lifecycle model is (assumed to be) the actual 'terrain' (i.e. the actual reality 'out there' in the world).		Towards: the development of new models and theories which recognise and illuminate the <i>complexity</i> of projects and project management, at all levels. And towards: new models and theories which are explicitly presented as only <i>particle</i> theories of the complex 'terrain'.

Implication

The need for *multiple images* to inform and guide action at all levels in the management of projects, rather than just the classical lifecycle model of project management, as *the* main guide to action, (with all its codified knowledge and techniques). Note: theories ABOUT practice can also be used as theories FOR practice.

Theory *FOR* Practice

Direction 2

Projects as Instrumental Processes	➡	Projects as Social Processes
From: the instrumental lifecycle image of projects as a linear sequence of tasks to be performed on an objective entity 'out there', using codified knowledge, procedures and techniques, and based on an image of projects as temporary apolitical production processes.		Towards: concepts and images which focus on social interaction among people, illuminating: the flux of events and human action, and the framing of projects (and the profession) with an array of social agenda, practices, stakeholder relations, politics and power.

Direction 3

Product Creation as the Prime Focus	➡	Value Creation as the Prime Focus
From: concepts and methodologies which focus on: <i>product creation</i> – the temporary production, development, or improvement of a physical product, system or facility etc – and monitored and controlled against specification (quality), cost and time.		Towards: concepts and frameworks which focus on: <i>value creation</i> as the prime focus of projects, programmes and portfolios. Note however: 'value' and 'benefit' as having multiples meanings linked to different purposes: organisational and individual.

Direction 4

Narrow Conceptualisation of Projects	➡	Broader Conceptualisation of Projects
From: concepts and methodologies which are based on: the narrow conceptualisation that projects start from a well-defined objective 'given' at the start, and are named and framed around single disciplines, eg. IT projects, construction projects, HR projects etc.		Towards: concepts and approaches which facilitate: broader and ongoing conceptualisation of projects as being multidisciplinary, having multiple purposes, not always pre-defined, but permeable, contestable and open to renegotiation throughout.

Theory *IN* Practice

Direction 5

Practitioners as Trained Technicians	➡	Practitioners as Reflective Practitioners
From: training and development which produces: practitioners who can follow detailed procedures and techniques, prescribed by project management methods and tools, which embody some or all of the ideas and assumptions of the 'from' parts of 1 to 4.		Towards: learning and development which facilitates: the development of reflective practitioners who can learn, operate and adapt effectively in complex project environments, through experience, intuition and the pragmatic application of theory in practice.

(Winter et al. 2006, p. 642)

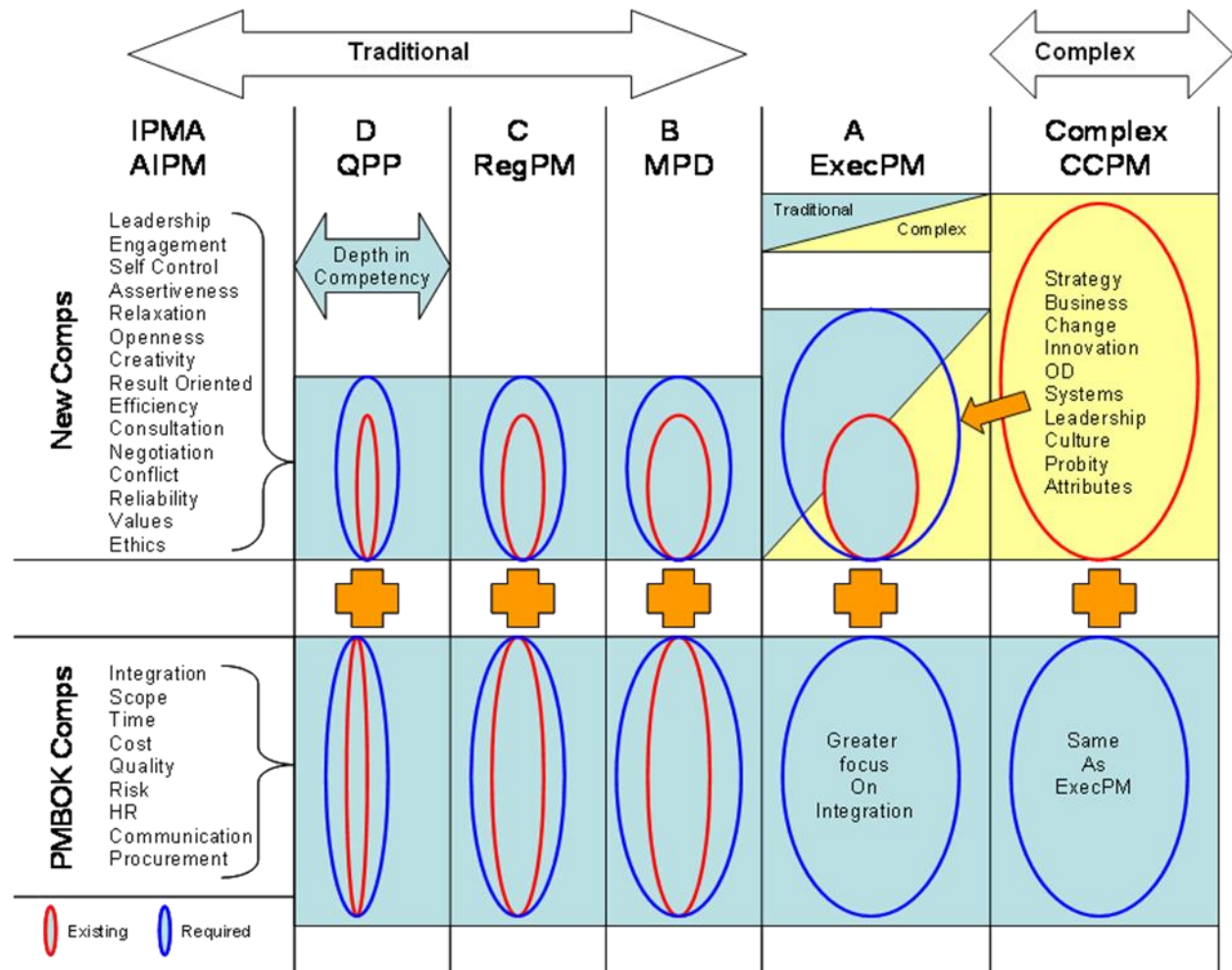
Appendix 2: Expertise, Competence and Knowledge in Project Work and Management

Level	Experience	Action based on	Comment
Novice	Faces a given problem and a given situation in a given task area for the first time	<ul style="list-style-type: none"> • Instructions (training course, PMBOK®) • Learning to recognise objective facts about and characteristics of the situation (models and definitions of project) • Learning rules of action, as generalised for all similar situations on the basis of identified facts, thus context-independent (project management methodology, procedures, best practice) • Evaluating the performance of the skills on the basis of how well the learned rules are followed 	The rules are necessary for gaining initial experiences but they can quickly become a barrier to acquiring skills at higher levels
Advanced Beginner	Achieves some real-life experience	<ul style="list-style-type: none"> • Learning to recognise relevant elements in relevant situations on the basis of their similarities with previous examples (typology of projects) • The context of experience becomes important and decisive in the choice of relevant elements, in addition to context-independent rules (learning from experience, limited reflection) PMBOK® trial and-error 	Personal experience via trial and error becomes more important than context-independent, verbally formulated facts and rules
Competent Performer	With more experience the number of recognisable elements and facts becomes overwhelming	<ul style="list-style-type: none"> • Learning from own experience and from others to prioritise elements of the situation • Organising information by choosing a goal and a plan • Dealing only with a set of key factors relevant to the goal and plan, thus simplifying the task and obtaining improved results • The choice of a certain goal and plan and the need to have a plan is paradoxical (simultaneous subjectivity and objectivity) – it is not unproblematic and requires deliberation, the relationship of involvement between performer and environment • Elements-rules-goals-plans-decision: the model of 	The individual learns to apply hierarchical, prioritising procedure for decision-making on the basis of set priorities rather than on total knowledge of the given situation Choosing the goal and plan is not unproblematic – it implies personal involvement in actions, hence responsibility/ethics

		analytical, proficient performer <ul style="list-style-type: none"> • Ability to think on one's feet (confidence, reflection, choice of action and risk taking) 	
Proficient Performer	Away from cognitivist, analytical rationality (rules, principles, and universal solutions) towards perceiving situations rapidly, intuitively, holistically, visually, bodily, relationally	<ul style="list-style-type: none"> • The awareness of interpretation and judgement involved in such decision making, rather than logical information processing and analytical problem solving only • Deeply 'involved-in-the-world' manager/performer who already knows as he/she has evolved their understanding of the situation on the basis of prior actions and experience • Reflective understanding and participation in power relations 	Intuitively understands and organises the tasks in the local situation in the living present but continues to reflect analytically on what will happen as the emergent situation unfolds
Expert or Virtuoso		<ul style="list-style-type: none"> • 'Emergent enquiry' – participative methodology of knowledge creation in context • Intuitively, synchronously • Participative critical reflection over the intuition – the self and the Group • The thought, body, knowledge, and action are inseparable, are simultaneously forming and are being form by one another; thinking- doing • Understanding that power relating is an intrinsic part of intersubjective relating, always there • Considerations for the present and deliberation about the future 	Characterised by effortless performance at the level of virtuosity; No thinking/doing, decision/action, or plan/implement divide; Action based on logic replaced by experientially based action; intuitive and rational at the same time

(Cicmil et al. 2006, p. 680)

Appendix 3: AIPM Competency Model



(AIPM 2010)