

Australian National Training Packages – A Critical Analysis

Stanislaw Paul Maj¹

¹ Engineering Institute of Technology, Australia

Correspondence: Stanislaw Paul Maj, Engineering Institute of Technology, 1031 Wellington St., West Perth, 6005, Western Australia. Tel: 1300-138-522. E-mail: paulm@eit.edu.au

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Abstract

In the Australian Further Education sector all education is based on national training packages which are designed and managed to meet the needs of different industries. They provide specifications of training elements; the associate performance criteria; expected required knowledge and skills all benchmarked against defined evidence guides. Significantly they do not define content or how the content should be taught with regard to both depth and scope. The advantage of this approach is flexibility with respect to interpretation and implementation. The disadvantage is potential differences in implementation. Three implementations were evaluated to assess this potential problem. The results clearly show an extreme difference in implementation. This cannot be consistent with national benchmarked standards. Further work is needed.

Keywords: training, training packages, further and vocational education

1. Introduction

1.1 Australian National Training Packages

Within the Australian Further Education sector education is based on training packages. According to Service Skills Australia,

A training package is a set of nationally endorsed standards and qualifications for recognizing and assessing people's skills in a specific industry, industry sector or enterprise. (Australia)

Training packages are developed and managed nationally by the relevant Industry Skills Council (ISC) and consist of three components:

- *Units of competency: define the skills and knowledge to operate effectively and how they need to be applied to perform effectively in a workplace context.*
- *Qualifications framework: groups of units of competency ranging from Certificate I to Graduate Diploma level.*
- *Assessment guidelines: the industry's preferred approach to assessment, including the qualifications required by assessors, the design of assessment processes and how assessments should be conducted. (Authority)*

The ICAPMG501A Manage IT projects training package was evaluated according to a learning taxonomy and its implementation at different institutions in order to determine if this training package was equivalent regardless of institution.

1.2 Anatomy of ICAPMG501A Manage IT projects Training Package

Training packages are available nationally and can be obtained from a central web site. All training packages are based on a standard template; only the headings directly relevant to this analysis are itemized below. According to training.gov:

Unit descriptor

This unit describes the performance outcomes, skills and knowledge required to manage information technology (IT) projects within a medium to large organization.

Application of the Unit

This unit applies to information and communications technology (ICT) practitioners who manage the initiation, implementation and completion of reasonably complex IT projects in terms of scope, risk, control and financial

factors. The projects vary across a wide range of ICT, financial, management and business areas. The provision of specific IT-related project management within projects is a key component of the ICT environment.

Pre-requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance criteria

Author comments - Elements describe the essential outcomes; performance criteria describe the performance needed to demonstrate the element has been achieved. The assessment of performance must be consistent with the evidence guide.

Element	Performance Criteria
1. Manages project definition activities	1.1 Confirm organizational project governance policy and processes 1.2 Confirm using problem or opportunity as well as project objectives 1.3 Develop a project charter, including preliminary statement of project scope and obtain sign-off 1.4 Conduct a feasibility study and prepare a business case as necessary
2. Undertake project planning	2.1 Plan information-gathering activities to determine project requirements, constraints and risks 2.2 Identify project partitioning on the basis of intended system development life cycle and risk 2.3 Prepare project work breakdown, schedule and budget 2.4 Compile project-management plan documents as necessary to communicate the intended management strategy for the project and obtain sign-off
3. Establish the IT project team	3.1 Identify and select team members, including roles and responsibilities, based on project solution requirements 3.2 Determine training and support needs of team members 3.3 Establish project team values and agreed behavioral standards with team members
4. Manage project execution activities	4.1 Monitor delivery and acceptance of assigned project team work activities and manage individuals as necessary 4.2 Monitor and control the quality of project deliverables 4.3 Monitor and control project scope changes, risks and issues 4.4 Manage system testing and hand-over activities
5. Coordinate project closure	5.1 Prepare IT support plans and maintenance or support documents 5.2 Obtain final project sign-off 5.3 Conduct post-project review and document lessons learned 5.4 Review and update disaster recovery plan 5.5 Close project

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to determine current system deficiencies and new system objectives
- communication skills to:
 - gather stakeholder needs
 - liaise with enterprise senior management
- counselling skills to mentor and coach team members and resolve conflict
- literacy skills to present options and recommendations in reports
- negotiation skills to ensure expected project outcomes are achievable
- numeracy and documentation skills to develop cost-benefit analyses

- planning and organizational skills to plan project activities
- research skills to identify solution alternatives
- technical team management and leadership skills, including providing feedback.

Required knowledge

- characteristics of leaders and technical teams
- consultation and communication techniques and strategies
- how to establish technical teams and determine stages of team development
- estimation and cost-analysis techniques
- methods of communication and communication styles, including interviewing techniques
- objectives and benefits analysis
- organisational values, policies and processes
- performance management and project team appraisal methods
- processes for monitoring team and own performance
- project cash flow and budgeting
- range of project-management methods and tools
- self-awareness
- systems analysis and modelling techniques
- team roles and delegation within a multi-project methodology context
- technology solution models and frameworks.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.(Government)

2. ICAPMG501A Manage IT Projects Training Package Analysis Method

The five elements broadly define project management that could be applied in a wide range of industries. However the performance criteria do not define what should be taught to achieve these elements. This is in keeping with the function of training packages, which according to Service Skills Australia,

Despite the name, training packages do not describe how people should be trained. Rather they provide the nationally endorsed standards against which training can be develop and flexibly delivered to meet particular local, individual, industry and enterprise requirements. (Australia)

Consider element 2. Undertake project planning and two of the associated performance criteria (table 1). An elaboration of the performance criteria is defined in the training package section ‘Required Skills and Knowledge’ which identifies the essential skills and knowledge a person must be capable of in order to perform to an acceptable standard in the workplace – referred to as learning outcomes. In effect,

A learning outcome is a clear and specific statement of what students are expected to learn in a unit and to be able to demonstrate at its completion. (Wikipedia)

In the case of element number 2, the required knowledge learning outcomes are generic without any specific details. This is complemented by the Evidence guide section which provides advice on assessment (table 1).

Table 1. Element, Performance criteria, required knowledge, and Evidence guide

Element	Performance criteria	Required knowledge	Evidence guide
2. Undertake project planning	2.2 Identify project partitioning on the basis of the intended system development life cycle	<ul style="list-style-type: none"> • Estimation and cost-analysis techniques • Project cash flow and budgeting 	Define, plan, execute and close a reasonably complex project to meet project requirements
	2.3 Prepare project work		

breakdown, schedule and budget	<ul style="list-style-type: none"> • Range of project management methods and tools • Systems analysis and modelling techniques
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The standard to be achieved is further defined by the associated Australian Qualification Framework (AQF) and the expected outcomes (table 2) – which in this case is at Diploma level (Framework).

Table 2. AQF

Summary	Knowledge	Skills	Application of knowledge and skills
Graduates at this level will have specialized knowledge and skills for skilled/paraprofessional work and/or further learning	Graduates at this level will have technical and theoretical knowledge in a specific area or a broad field of work and learning	Graduates at this level will have a broad range of cognitive, technical and communication skills to select and apply methods and technologies to: <ul style="list-style-type: none"> • analyse information to complete a range of activities • provide and transmit solutions to sometimes complex problems transmit information and skills to others	Graduates at this level will apply knowledge and skills to demonstrate autonomy, judgment and defined responsibility in known or changing contexts and within broad but established parameters

The main advantage of this approach to teaching and learning is the ability to broadly interpret the guidelines and hence to be flexible for developing content to meet specific needs. However, because the required knowledge is generic and unspecified there is potentially considerable scope of radically different interpretations of both content and depth of treatment. For example the element 2, required knowledge Range of project management methods and tools is potentially subject to extremely diverse interpretations ranging from the rudimentary such a being able to list methods and tools to the other extreme of having an in-depth knowledge of them.

2.1. Learning Taxonomy Evaluation of ICAPMG501A Manage IT Projects Training Package

To produce lecture material and teach this subject a lecturer needs to know the expected depth to which the subject should be taught. The evidence guides along with the associated AQF level are indicators of the expected depth of treatment but do not provide sufficient guidance regarding depth of treatment.

The ICAPMG501A Manage IT projects training package was analyzed using the Structured Observation of Learning Outcomes (SOLO) taxonomy of assessing learning outcomes. The SOLO taxonomy defines four main taxonomy levels (excluding pre-structural) – uni-structural, multi-structural; relational and extended abstract. Uni-structural and multi-structural are low order learning outcomes allied to rote learning (table 3) (Biggs and Collis 1989). The relational and extended abstract categories represent deep, high order learning outcomes. The taxonomy levels can be related to terminology used in the training package being analyzed (Table 4).

Table 3. SOLO Taxonomy

Taxonomy level	Level of learning	Defined by:	Meaning
Extended abstract	High order learning	Generalize, hypothesize	Student conceptualizes at a level extending beyond what has been dealt with in the actual teaching. Understanding is transferrable and generisable to different areas.
Relational	High order learning	Compare and contrast, analyze, explain, relate, apply	Student understands multiple components and their conceptual integration.
Multi-structural	Low order learning	Enumerate, list, describe	Student can understand several components but understanding is discrete. The significance of the whole is not understood with few if any relational links
Uni-structural	Low order learning	Identify, do	Simple and obvious connections are made but broader significance is not understood.

The performance criteria verbs in this training package are predominantly at the relational (high order learning) taxonomy level (table 4). This strongly implies the expectation of high order learning outcomes. This is in keeping with the evidence guide and the required ability to: define, plan, execute and close a reasonably complex project to meet project requirements.

Table 4. Evaluation of performance criteria

Taxonomy level	Elements and performance criteria	
Extended abstract	High order learning	
Relational	High order learning	Develop, plan, establish, conduct, prepare, compile, manage
Multi-structural	Low order learning	Monitor, determine
Uni-structural	Low order learning	Confirm, identify

3. Results

To be compliant with regulatory standards each institution is required to generate further documents that include:

- Training and Assessment Strategy (TAS)
- Learning Plan
- Lesson Plans or lecture materials
- Assessment Information
- Assessment guides
- Assessment matrix

Three implementations were evaluated. Points to note are:

- Only the resources provided were analyzed; no classroom observations were made
- The resources provided were all deemed to be sufficient for any lecturer to teach the subject
- All implementations were compliant with regard to national regulatory standards
- Student contact time for implementation 1 and 2 was one day per week; for implementation 3 contact time was one hour per week. However there was an expectation of significant student self-study time
- All implementations tracked the normal project management sequence with allied topics
- All implementations had received positive student feedback

The lecture material and all available supporting materials of both implementations were evaluated according to the SOLO taxonomy levels.

Table 5. Implementation 1

Implementation 1	Analysis	Supporting documents
1. Project Framework	43 slides Predominantly definitions; no in depth treatment found Minimal elaboration	Sample PM methodologies Worksheet (2 pages - superficial)
2. Scope	8 slides Predominantly definitions; no in depth treatment found Minimal elaboration	
3. Business model	7 slides with diagrams only and no supporting text	
4. Stakeholders	Unknown	
5. Work Breakdown Structure (WBS)	7 slides Minimal elaboration	Worksheet (2 pages) Microsoft project case study
6. Budget	5 slides Predominantly definitions; no in depth treatment found Minimal elaboration	Worksheet (2 pages)
7. Risk	41 slides Definitions; some elaborations	Risk Management documentation for to professional bodies
8. Quality control	23 slides Generic discussion, some class activities	Two handouts
9. Communication	12 slides No in depth treatment found Minimal elaboration	6 diagrams – unknown use
10. Change management	5 slides No in depth treatment found Minimal elaboration	Sample change request form
11. Human resources	20 slides Predominantly definitions; no in depth treatment found Minimal elaboration	
12. Human resources	Duplication of above	
13. Scheduling	14 slides	Communication styles Worksheet (4 pages) Article (9 pages)
14. Business solutions	5 slides	
15.	Total author generated material: 190 slides	
Supporting material	Textbook provided slides – good topics coverage. 41 slides supplied by publisher	
Supporting material	Case study material	

Points to note include:

- 40% of all lectures consist of less than 10 slides
- 60% of lectures consist of 20 slides or less
- Average of 13 slides per 8 hours of tuition
- Topics not included:
 1. Systems, system boundary
 2. Hierarchical top down decomposition, sequencing, concurrency

3. Tutorials on using Microsoft Project
4. System development life cycle, RFP, proposal
5. Contract law
6. Contract types (e.g. firm fixed price etc.)
7. Specification methods
8. Quality Function Deployment (or similar)
9. Direct and Indirect costs
10. Estimation methods (e.g. analogy, parametric etc.)
11. Well defined work packages

Table 6. Implementation 2

Implementation 2	Analysis	Supporting documents
1. Project management	52 slides Overview	PMBOK reference
2. Systems	51 slides Comprehensive, in-depth treatment of topic	Microsoft project
3. Systems Development Life Cycle (SDLC)	81 slides Comprehensive, in-depth treatment of topic	
4. Contract law	74 slides Comprehensive, in-depth treatment of topic	Extensive student exercises
5. Budget	67 slides Comprehensive, in-depth treatment of topic	Extensive student exercises
6. Specification	66 slides Comprehensive, in-depth treatment of topic	Extensive student exercises
7. Quality Function Deployment (QFD)	64 slides Comprehensive, in-depth treatment of topic	Extensive student exercises
8. Work Breakdown Structure (WBS)	132 slides Comprehensive, in-depth treatment of topic	Detailed case studies implemented in Microsoft Project
9. Scheduling	70 slides Comprehensive, in-depth treatment of topic	
10. PERT	63 slides Comprehensive, in-depth treatment of topic	Extensive student exercises
11. Risk	83 slides Comprehensive, in-depth treatment of topic	Exemplar template Extensive student exercises
	Total author generated material: 803 slides	
Recorded tutorial on supporting material	22 slides	
Recorded tutorial on supporting material	89 slides	
Recorded tutorial on supporting material	53 slides	
Recorded tutorial on supporting material	48 slides	
Recorded tutorial on supporting material	140 slides	

Points to note include:

- Average of 73 slides per 8 hours of tuition
- Four additional recorded tutorials on supporting material

- Each lecture included extensive interactive exercises
- Comprehensive subject coverage with respect to both scope and depth

Table 7. Implementation 3

Implementation 3	Analysis	Supporting documents
1. Introduction	17 slides Overview	Lecture material on systems engineering – 24 slides
2. System Development Life Cycle	79 slides Comprehensive, in-depth treatment of topic	Contracts - 40 slides
3. Project and systems	42 slides Comprehensive, in-depth treatment of topic	Waterfall and Agile - 11 slides QFD - 10 slides
4. Planning	60 slides Comprehensive, in-depth treatment of topic	Line of balance 23 slides
5. Scheduling	54 slides Comprehensive, in-depth treatment of topic	Resource levelling - 18 slides
6. Critical Path Method	28 slides Comprehensive, in-depth treatment of topic	Comprehensive 75 slides
7. PERT	13 slides Overview only	Comprehensive 52 slides Resource allocation 21 slides Critical chain 80 slides
8. Cost Estimating and Budgeting	38 slides Basics plus some subject elaboration	
9. Project Quality Management	54 slides Comprehensive, in-depth treatment of topic	
10. Project Risk Management	43 slides Comprehensive, in-depth treatment of topic	
11. Project tracking – execution and control	67 slides Comprehensive, in-depth treatment of topic	
12. Project – evaluation, implementation and closure	28 slides Overview	
	Total slides: 523	Total supplementary slides: 354

Points to note include:

- Average of 33 slides lecture
- Ten topics available as supplementary material providing further scope and depth
- Comprehensive subject coverage with respect to both scope and depth

4. Discussion

Three implementations of the training package ICAPMG501A Manage IT projects were evaluated. It should be stressed that this analysis should not be seen as a criticism of any of the implementations as all implementations were fully moderated and validated – hence deemed to be compliant to a national standard. As such they all met the training package requirements regarding elements, their performance criteria and required skills and knowledge based on the evidence guide. All three implementations had received positive student feedback. In addition to which they were all fully compliant with regard to the associated documentation.

- Training and Assessment Strategy (TAS)
- Learning Plan
- Lesson Plans or lecture materials
- Assessment Information
- Assessment guides
- Assessment matrix

Whilst the number of slides may seem a crude evaluation metric, it proved to be strongly indicative of both the scope and depth of treatment (table 8). Implementation 1 had numerous instances of extremely limited number of lecture slides. With this seeming paucity of material there was no evidence of:

- Scaffolding (progressing from simple to complex i.e. from uni-structural to multi-structural to relational);
- Worked examples by demonstration and associated student exercises

However it is acknowledged that during student contact time there may well have been lecturer led discussions based on the case study provided. However the supporting lecture material did not appear to support high order learning of the principles and practices of project management sufficient to conduct an in-depth case study.

Table 8. Summary

	Total number of slides	Supporting material – total number of slides	Scope and depth of treatment	SOLO taxonomy level
Implementation 1	190	41	Significant number of topics not taught	Predominately low order learning
Implementation 2	803	352	Comprehensive – all major topics addressed	Consistent with relational knowledge, high order learning
Implementation 3	523	354	Comprehensive – consistent with relational knowledge, high order learning	Consistent with relational knowledge, high order learning

Despite the extremely wide variation in both scope and depth all three implementations are considered to be equivalent nationally. This paper concludes that this cannot be supported from not only content but also a pedagogical perspective. Further, more comprehensive evaluations are needed.

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