

## **Identification of Numeracy and Literacy skills of Apprentices and Trainees at Central Gippsland Institute of TAFE**

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This project has been designed to explore the findings of research that has been undertaken by staff at Central Gippsland Institute of TAFE. This research project addresses Apprentices and Trainees whose literacy and/or numeracy skill levels are possible barriers to the completion of their training.

In the implementation of this study, a generic Numeracy and Literacy assessment tool was developed. All GippsTAFE students commencing an Apprenticeship or Traineeship in 2008 were required to complete the Numeracy and Literacy assessment tool prior to study. This information was compiled for fifteen sub-groups who participated and addressed specific tasks undertaken (numeracy results from three of these sub-groups feature in this paper). Data was tabled to determine the 'skill gaps' presented for each sub-group. Information was then compiled for the whole cohort, and tabled to determine where 'skill gaps' presented. This information can now be used in the establishment of strategies to support those students who require assistance in order to complete their studies. This project has far reaching implications including the ability to increase completion rates across Central Gippsland Institute of TAFE amongst students requiring Numeracy and Literacy support. Questions raised in regards to the implementation and use of such a strategy include:

- What are the benefits of a 'screening process' prior to undertaking study in VET and what are the implications of this?
- How can Numeracy and Literacy assessment tools be contextualised to meet the requirements of any cohort?
- How can strategies be implemented as a result of these findings that are equitable, flexible and sustainable?
- How can this information be disseminated to the broader VET context?

## INTRODUCTION

In 2004, the Australian federal government identified the need to address barriers to learning including ‘literacy [and] numeracy’, by ‘taking positive steps to achieve equality of participation and achievement’. These learning needs should be attended ‘through an integrated diversity management approach’ (Shaping our Future, 2004, p.17). In 2007, Kevin Rudd released the policy document: *Skilling Australia for the Future*. This paper identified the need to address ‘accountability for quality and increas[e] completion rates’, stating that the delivery of training in Australia will be ‘more flexible and responsive to the needs of industry and individuals’, including ‘[l]iteracy and numeracy’ (Skilling Australia for the Future, 2007, p.9-12). In a study into reasons for non-completion and dissatisfaction among apprentices and trainees, Snell & Hart (2009), identify issues for apprentices and trainees ‘in training but at risk of not completing’ such as ‘problems in workplace, low wages, problems with training, lack of support, ....requirement of what is probably a temporary job or wrong career choice’ (p.52). In that study, factors such as skill gaps in numeracy and literacy were not addressed. These may be issues that underpin those identified.

As a Registered Training Organisation (RTO), Central Gippsland Institute of TAFE (GippsTAFE) is required to conduct a ‘pre-training review of literacy and numeracy skills for each eligible apprentice and trainee’. Where there is a discrepancy between the apprentice’s/trainee’s skill levels and the skills required to successfully undertake the training, the RTO is obliged to provide ‘literacy and/ or numeracy support’. (Apprenticeship Traineeship Training Program (ATTP) Minimum Performance Standards (MPS), 2008, p.12). It is by this definition the term ‘skill gaps’ is used as a reference in this study. It was identified at GippsTAFE that an institute-wide approach, using a standard diagnostic ‘tool’ to determine skill gaps in numeracy and literacy in enrolled trainees and apprentices was required to meet the ATTP MPS. This paper examines the results of data collected from fifteen sub groups who represent all apprentices and trainees enrolled in study at GippsTAFE in 2008. This follows the introduction of this diagnostic ‘tool’ and explores how this information may be interpreted to implement quality literacy and numeracy support interventions both at GippsTAFE and the broader Vocational Education and Training (VET) sector.

The use of an institute-wide approach in the diagnosis of skill gaps amongst apprentices and trainees at GippsTAFE is essentially a 'screening process'. There are implications here regarding the use and distribution of this information. Is the generic assessment tool suitable to determine if there is a discrepancy between the apprentice/trainee skill levels and those required of the student whilst undertaking study at GippsTAFE, in any area of study? If not, how can it be contextualised while maintaining validity? How should the information gathered by the process of assessment be disseminated and utilised to ensure it empowers participants rather than 'label' them? What strategies can be implemented to address numeracy and literacy skill gaps identified in analysis of data that are equitable, flexible and sustainable?

## RESEARCH METHOD

The research addressed in this paper was conducted on an 'informal' basis. Those involved in the collection and collation of data for this project have no formal training in research. Informal research can be 'quite effective as a "first warning" mechanism to alert you of member and industry trends, issues, and impressions. Data collected informally is also an excellent starting point for more comprehensive efforts, or to quickly test an idea prior to a more rigorous study' (AWP Research, 2009). A screening tool was used to gather information from participant apprentices and trainees who undertook study at GippsTAFE in 2008. This process was required to meet ATTP MPS and initiated by GippsTAFE as a RTO. The collection, tabling and interpretation of data as a result of this screening process was undertaken by an Educational Facilitator who had been assigned the role of facilitating the implementation of the numeracy and literacy screening process for apprentices and trainees undertaking study in 2008 at GippsTAFE. After identifying a need to do more than simply assess and categorise students for support, the collection and collation of data was initiated. This information could then be used to shape the development of numeracy and literacy assessment tools, to question strategies to address skill gaps in numeracy and literacy at GippsTAFE and to share this information with other VET practitioners.

Educational Facilitators are well versed in the collection, analysis and distribution of information, in a climate of diversity in regards to client, location and type of delivery

required and the need for maintenance of currency in skill delivery. Dickie, Eccles, FitzGerald and McDonald (2004, cited in Mitchell, 2005) describe this as ‘an environment characterised by increasing diversity in the client base; increasing sophistication in client expectations; change in products and expansion of options for training delivery; changes in employment, work roles, team structures and places of work; increasing competition and increasing demand; and globalisation of the training market’. Given the need for VET Practitioners to operate effectively in this ever evolving environment, it is likely also they will identify issues relevant to this context. It is also possible they may identify issues or trends that may not have been identified in formal research programs. The need to monitor the development of numeracy and literacy assessment tools, to question strategies to address skill gaps in numeracy and literacy and to share this information with other VET practitioners in the promotion of increased completion rates amongst apprenticeships and traineeship are such examples.

For this research, quantitative data was collected following the implementation of a generic diagnostic tool. Information was collated to identify trends in skill gaps in both individual areas of study and also the whole sample group. In 2008, five hundred and fifteen first year apprentices and trainees were assessed using the generic diagnostic tool, named: Apprentice & Trainee Skills Assessment following enrolment. GippsTAFE departments involved included: Automotive, Electro Technology, Hospitality, Hair and Beauty, Horticulture, Painting and Decorating, Information Technology, Business, Sport and Recreation, Joinery, Cabinet Making, Health and Community Studies, Civil Construction, Electrical Distribution and Telecommunications. These departments represent all those that enrolled apprentices or trainees in 2008 at GippsTAFE.

## ASSESSMENT TOOL

The Apprentice & Trainee Skills Assessment is a paper based document, based on questions used to measure numeracy and literacy levels. This document was prepared by GippsTAFE staff in consultation with the Apprentice Support Co ordinator, Northern Metropolitan Institute of TAFE (NMIT), who had previously developed a similar instrument for use at NMIT. It was also a modification of a pre existing

document (Vocational Selection Test) produced by the Australian Council for Educational Research (ACER) which was deemed to be inappropriate for use as it was too generic and did not focus on tasks specifically relevant to trade areas. Participants were informed that the assessment is not a test and will not be used to determine eligibility to study at GippsTAFE. Rather it will be used to determine if assistance with numeracy and literacy skills is required.

The Apprentice & Trainee Skills Assessment consists of five sections that address the following:

1. Student personal details

- Name
- Student number
- Employer
- Phone number
- Mobile number
- Email Campus
- Course code
- Date

2. Maths

(Combination of calculation and multiple choice)

- Simple addition (Question 1)
- Simple subtraction (Question 2 and 3)
- Simple division (Question 4)
- Simple multiplication (Question 5)
- Adding decimal numbers (Question 6)
- Bill payment - multiplication, addition, subtraction and percentage (Questions 7, 8 and 9)
- Salary calculation - multiplication, division, fractions (Questions 10 and 11)
- Reading a graph (Question 12)
- Reading a tape measure - imperial, metric (Question 13 and 14)

- Calculation of time (Question 15)
  - Perimeter (Question 16a)
  - Area (Question 16b)
3. Comprehension
- Reading (excerpt from ‘Health hazard information – Acetone’)
  - Four multiple choice questions relating to the text
4. Writing

Participants asked to write about:

- Their life in 5 years, or
- Why computer skills are important

(1 page of lined paper provided)

5. Students self assessment (Participants are asked to rate their skills in maths, reading and writing as ‘confident’, ‘OK’, or ‘may require additional help’. Participants are asked if they would like to receive feedback on their assessment)

Assessments were conducted without the use of calculators and maximum time of 30 minutes was allowed. Results were compiled for each sub-group who participated. Data was tabled to determine the skill gaps presented for each sub-group. Information was then compiled on a project wide basis, and tabled to determine where skill gaps presented across all participants. A skill gap (or discrepancy between the apprentice/trainee skill levels and those required of the student whilst undertaking study at GippsTAFE), has been tabled below for three sub-groups where failure to complete a task or failure to complete a task correctly is recorded by 50% or more of participants. Skill gaps (indicated with a cross) are recorded below to demonstrate how results may differ for the three tabled sub-groups:

1.1 A sample of three sub-groups involved in research data collection, representing differing results in different trade areas for numeracy tasks

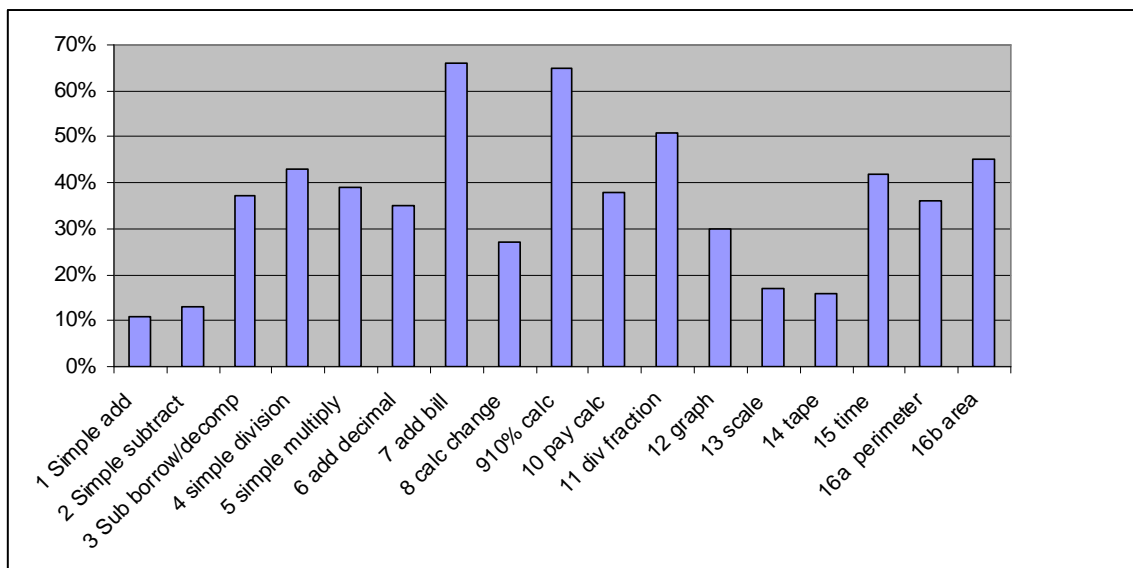
<b>DEPARTMENT AND NUMBER OF PARTICIPANTS</b>	<b>PAINTING AND DECORATING (4 PARTICIPANTS)</b>	<b>ELECTRICAL DISTRIBUTION (28 PARTICIPANTS)</b>	<b>HAIRDRESSING (15 PARTICIPANTS)</b>
Simple addition	X		
Simple subtraction			
Simple division			X
Simple multiplication			
Adding decimal numbers	X		
Bill payment	X	X	X
Salary calculation			X
Reading a graph			
Reading a tape measure			
Calculation of time	X		X
Perimeter	X		
Area	X		
Reading	X		X
Writing	X		X

Results of data collected indicate there are different skill gaps in different departments at GippsTAFE in 2008. These figures may vary due to the number of participants in the sub-groups and the knowledge and experience of participants in different areas of study. For example Electrical Distribution trainees who participated in this study were as a group older and more experienced than those represented in the Painting and Decorating and Hairdressing sub-groups. This is reflected in their ability to answer questions in the assessment tool correctly and also the type of questions that

were not answered or answered incorrectly. A need to develop contextualised assessment tools for different areas of study at GippsTAFE and, in turn appropriate numeracy and literacy support strategies is indicated. Implementing an institute wide approach to the diagnosis of skill gaps amongst apprentices and trainees at GippsTAFE is essentially a ‘screening process’. The use of the generic assessment tool: Apprentice & Trainee Skills Assessment is not sufficient to meet the needs of all apprentices and trainees in all areas of study at GippsTAFE.

For the overall group (515 participants), results in the form of percentage for questions regarding numeracy answered incorrectly are recorded. Skill gaps are defined as when 50% or more of the overall group answered questions incorrectly or could not complete the task. This is demonstrated on the table below:

1.2 Table of overall group of apprentices and trainees enrolled at GippsTAFE in 2008 with incorrect answers to questions in the numeracy section of the numeracy and literacy assessment tool.



Results tallied for all 515 participants from all areas enrolling apprentices and trainees at GippsTAFE in 2008 indicate skill gaps in tasks regarding Bill payment (multiplication, addition and percentage – questions 7 and 9) and Salary calculation (division and fractions – question 11). This indicates that as a cohort, participants



could complete basic tasks such as simple addition, subtraction or multiplication correctly but given more complex tasks they were unable to complete or complete with a correct answer.

A need to implement quality literacy and numeracy support intervention is indicated. Programmes such as the 'Literacy, Numeracy and Special Learning Needs Programme', which 'aims to improve the literacy, numeracy and other learning outcomes of students who are educationally disadvantaged and who require additional assistance' (DEEWR, 2009), offer assistance to students with identified learning disabilities. What of those who have undisclosed disabilities? Or those who have not had the opportunity to learn in an environment that caters to their learning style or preference? Finding solutions to skill gaps in numeracy and literacy is essential both at GippsTAFE and the broader VET sector. Questions remain as to how these interventions should be shaped, and how this information may be disseminated both to GippsTAFE staff, and the broader VET sector.

The use of a generic screening tool to determine numeracy and literacy may be flawed. Given learners differing knowledge and experience, learning styles and preferences, it is unlikely a paper based generic assessment tool will accurately assess the numeracy and literacy of all apprentices and trainees. Tools to assess numeracy and literacy require contextualisation. This may be addressed by category of industry, cohort or even individual learner. It is likely to be an evolving process and one that requires flexibility. The key to this may be address by Dawe & Guthrie, (2004, cited in Mitchell, 2005) who state:

[J]udging within an ever changing environment.... may require working more effectively across disciplines and developing more personalised arrangements for delivery. VET providers need to identify where their strengths lie and build industry partnerships in these areas. Close collaboration with industry partners will enable VET providers to ensure the appropriate balance of practical and theoretical skills (p.1).

Such a perspective refers to the relationship between industry and training in the VET sector but this approach also transfers well to the development of contextualised

screening tools to determine numeracy and literacy skill gaps. These should be: personalised, collaborative and balanced.

## CONCLUSIONS

The research element of this project is less than formal and methods usually practiced in the formal collection and analysis of research have not been practiced. Despite this, the collection, collation, analysis of data regarding numeracy and literacy by VET Practitioners and more importantly discussion of findings amongst colleagues has great merit. 'Addressing skill shortages continues to be a major challenge for Australia with far reaching implications for the country's future economic prosperity. Improving completion rates among apprentices and trainees will help meet these challenges' (Snell & Hart, 2009). Given the need to address these challenges and the impact this will have both on learners and Australia's economic future, identified skill gaps in numeracy and literacy require strategies to support learners. This is true both in the early stages of study to initiate engagement, and during the period of study to embed a culture of lifelong learning. Snell & Hart (2009) say, 'Given the Rudd Government's election proclamation to carry out an Education Revolution it may be the opportune time for policy makers to pursue a fundamental redirection of Australia's vocational training system in order to better meet the nation's skill challenge'. In the mean time, if issues affecting attrition rates in apprentices and trainees are identified by VET Practitioners as being underpinned by skill gaps in numeracy and literacy, VET Practitioners are well placed to initiate the process of identifying and implementing strategies to address these issues.

The development of flexible, contextualised assessment tools to determine numeracy and literacy in apprentices and trainees should be addressed. The delivery of apprenticeships and traineeships do require a 'cross pollination' of skills. This is true more so as industry requires flexibility in its workers. Numeracy and literacy to date had been largely delivered by numeracy and literacy specialists. Perhaps it is time to up-skill all VET educators so as the basic or required numeracy and literacy skills learners require to engage in and complete studies may be integrated into their learning programmes. Collaboration with other departments within educational

institutes but also other educational bodies via networks would enable consistency and efficiency in this process.

Implications regarding the use and distribution of information collected in determining skill gaps in numeracy and literacy in apprentices and training requires further discussion. If there is the potential for information collected about a learner to be used to label and discriminate against them rather than to enable assistance to engage in learning, the process is flawed. Training for VET Practitioners in the implementation of screening tools and strategies to address gaps in numeracy and literacy is paramount in the facilitation of increased completion rates for apprentices and trainees. This in turn empowers VET educators to work with a solid grounding to analyse, reassess and reshape strategies facilitating a process that is flexible, adaptable and sustained.

Collection and analysis of data regarding skill gaps in numeracy and literacy at GippsTAFE should be ongoing. Changes on a global, federal, state or even institute wide level may affect training for apprenticeships and trainees in areas such as enrolments, industry requirements and areas of study. Trends in data collection may change over time with different student intakes. More research is required to explore how intervention into skill gaps in numeracy and literacy should be shaped, and how this information may be disseminated both to GippsTAFE staff, and the broader VET sector. This may be achieved via further qualitative research. It is likely that effective strategies to address skill gaps in numeracy and literacy are currently in place across the VET sector. Data collection, the development of networks and the sharing of knowledge and ideas on this topic will be paramount to finding effective solutions.

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- First year apprentices and trainees enrolled GippsTAFE in 2008.

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