The Struggling Apprentice: Reflections on practice in supporting trade apprentices who struggle with numeracy concepts.*

Patricia O'Donnell   Cathy Leung

Tropical North Queensland Institute of TAFE

The Queensland Government has instituted a number of strategies to address an acknowledged skill shortage in traditional trade areas. An apprenticeship, where an inexperienced employee is indentured to a qualified tradesman is a key feature of these strategies. The majority of trade apprentices in Queensland received their training through the publicly funded Technical and Further Education (TAFE) system.

This is the second paper of a pair looking at the work of the Learning Support Unit (LSU) at a large regional TAFE and discusses the challenges it faces in tying together the disparate networks that contribute to a successful apprenticeship. The paper reveals that a multi-disciplinary approach is not sufficient in itself to provide solutions to the problems facing the struggling apprentice.

While this research has a focus on technical numeracy, the researchers have also attempted to explore aspects and possibilities of changing the culture of relationships between apprentice, employer, vocational teacher and the learning support team.

Vocational interests are solutions to problems that people have experienced. Work becomes an opportunity to actively master what has been passively suffered. (Savakas, 2004)

Aim and Purpose of Study

The initial aim of the study was to document the process LSU practitioners undertook to implement a pre-course literacy and numeracy indicator, to develop an Individual Learning Plan (ILP) for each apprentice and to record the outcome of the plan in an attempt to measure the question 'Does this intervention make a difference?'

An unexpected consequence was the recognition of the significance of personal relationships within the social, cultural and personal lives of apprentices who are struggling to complete their apprenticeships; the connections with those who seek to provide learning and technical support and the relationships they all have with the workplaces which employ them.

Methodology

The project is framed by action research principles, in particular appreciative inquiry, (Cooperrider & Srivastva, 1987). Originally applied in the field of organizational dynamics, Appreciative Inquiry is an appropriate tool for this research as teachers are 'educational managers' who juggle complex, sensitive and competing social issues.

The researchers used reflective forums to examine a range of theories from different disciplines and case studies examining the processes used to determine valid and accurate diagnosis of learning and conceptual difficulties.

The Context

Staff of Tropical North Queensland TAFE continually explore methodologies to reduce the barriers of distance and isolation. Trainers and students negotiate the challenges of social gap and distance in culture and language. The Learning Support Unit (LSU) is based on an intervention technique which uses the principles of Appreciative Inquiry to isolate successful strategies and then implement institutional change extrapolating from the particular to the universal.

As the project team began to discuss the stories of success and failure the patterns of success were often found in those training plans that included intervention strategies that encompassed the training room, the learning support unit and the workplace. It was also evident that the case management role of the learning support teacher was not

adequately captured in the collection of data that constituted the reporting framework and, as such, was unrecognized as an integral component of the strategy.

The TAFE

Tropical North Queensland (TNQT) is uniquely situated as the most Northern Institute of TAFE in Queensland and services 13,000 clients across a 268,000 square kilometre area of north-eastern Australia, covering an area 15.5 per cent of Queensland (See figure 1).

It is the largest provider of training to indigenous Queenslanders, many from remote communities with a range of complex social challenges including poor educational outcomes and English as a second or third language (ESL).

The Apprentice

Apprentices bring with them the expectations of self, family, peers, of employer/s, Group Training Organizations, New Apprenticeship Centers, vocational teachers, and the regulatory requirements of their apprenticeship. Examining the Learning Support Unit management of these competing discourses provides room to discuss innovative approaches to the development of learning programs for an individual (Gee, 1996).

Apprentices are 'signed up' through New Apprenticeship Centers (NACs), who do not need experience in either industry or education to determine an apprenticeship. Training comprises a practical and a theoretical component. Apprentices attending the theoretical component called "Block Training" at TAFE and experiencing learning difficulties are referred to the Learning Support Team for assistance. Apprentices can sometimes be in the second year of their apprenticeship before they arrive at the Learning Support Room.
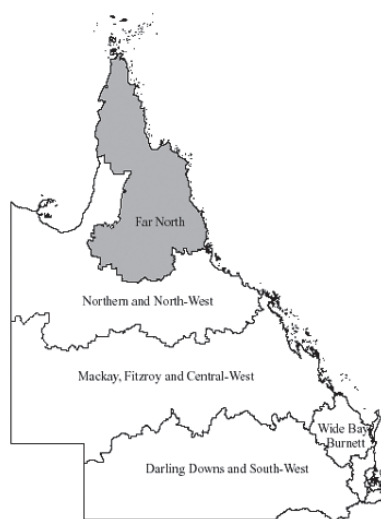
Figure 1: Map of Queensland showing TNQT's delivery area

The Employer

Traditionally, within this region, small businesses fuel the recruitment of apprentices. In indigenous communities, the apprentice is employed by the community council and often works within a family network in a supportive and familiar context. In urban areas small business employers often form a familial relationship becoming involved in many aspects of the apprentice's life. Small businesses also rely on the work rate of apprentices, needing them to show the self organization and work ethic of a mature employee. Failure of an apprentice to thrive within a small organization can reduce the slim margins many small businesses operate on.

The Learning Support Unit – a three phase approach

Apprentices access learning support by self identification, trainer referral or as a result of a pre course indicator. When identified, an individual learning plan (ILP) is developed which requires input from the student, employer, trainer and specialist literacy teacher, and is case managed by the Learning Support Teacher. It could include a combination of approaches, encompassing self paced remedial materials, alternative assessments, in class support, out of class support, or referral to diagnostic specialists.

The Learning Support Unit has developed a three phase approach to supporting the apprentice which fosters organizational change. The first phase concentrates on the apprentice as student. The second phase investigates relationships between employer, apprentice, vocational teachers, workplace assessors and trainers, TAFE Bureaucracy, and occasionally, the Department of Employment and Training who have a regulatory function within the apprenticeship. The final phase is the professional development of Vocational Teachers.

All stages try and capitalize on the rich and positive images usually associated with new beginnings and through 'inquiring with the heart' move the 'inner dialogue' of hope and confidence to the conscious and official forum of 'organizational business' (Bushe, 1998 p. 4).

Identifying the Struggling Apprentice

The aim of the ILP is to develop an overview of the student as learner, to identify vocational goals, work experiences, educational history and to detect gaps in basic skills. The findings are not used to exclude participation, but as an opportunity to effectively respond to student need and develop an appropriate management plan.

The tasks in the pre course literacy and numeracy indicators were developed in consultation with the delivery teams, who had input into the initial product, undertook trialing in the workplace and then gave feedback to the Learning Support Teacher on its effectiveness and how the assessment was received by the employer and the apprentice. To provide early intervention delivery teachers implement the assessment on sign-up of the apprentice, rather than commencement at formal TAFE classes. Although initial feedback was that long sign up procedures interrupt the workplace, the one-to-one nature of the interview led to apprentices disclosing more information about themselves and self identifying areas of need.

Building a database

Anecdotal evidence seemed to support the intervention strategies put in place by the Learning Support Unit. To determine if this feedback was supported by improved student results during off the job training, a database was created to statistically track the student. Initial data is gathered from a pre-course indicator which examines the ability of students to read for information, interpret a diagram, work with fractions and decimals, calculate and apply a formula. It is based on the National Reporting Scale, Level 4 of Technical Communication (DEST, 1999).

Analysis of database reports showed that significant numbers of apprentices lack the skills essential to their training. In the first six months of 2005, about 980 apprentices were enrolled at TNQTAFE. Eighty six apprentices from technical and outdoor industries submitted pre course assessments. Of these results, three students achieved 100%. Fifty five apprentices scored less than 70% in the math section and of those 27 scored less than 50% and 16 scored less than 20%. So far 78 of these students have enrolled in the support module to provide underpinning skills.

Support is given in a number of contexts, integrated, out of class and in the community. The question, "Does this intervention make a difference?" needs more time to be answered in a definitive way. Many students have improved off the job competencies, but follow up interviews will need to be conducted to see if this improvement translates to better on the job performance as well.

Professional Development of Vocational Teachers

There is some concern that the minimum qualification of trainers, Certificate IV in Workplace Assessment and Training does not develop the skills associated with the profession of teaching. The Australian Council of Adult Literacy raised concerns that "trainers……. would not have acquired sufficient knowledge of the underpinning skills in how people learn….. ACAL believes that LLN students often have special needs which require a specialist understanding" (Thompson, 2005).

To raise awareness of literacy issues in training packages the Learning Support Unit organised "Literacy Matters" workshops to help identify the associated language, literacy and numeracy practices inherent in the vocational skills assessed within the training package (Darveniza, 2005).

In order to "generate a collective image of a new and better future" (Bushe, 1995, p. 2) federal funds were accessed through the Reframing The Future program to undertake a project involving Learning Support Representatives from each TAFE Qld Institute to develop the technical skills of literacy teachers and create a web page that is particular to each institute but similar in content to ensure quality of product and information across the State.

Some vocational trainers have accessed the TROPIC program (Teachers Reflecting on Practice in Class) to add a further dimension to the reflective process (Davidson & Goldman, 2004). A trained observer provides constructive feedback on teacher student interactions to develop principles of management and communication.

Seeking opportunities for change.

Opportunities for change are embedded in a social perspective. "Fresh images and insights come from exploring the real stories people have about themselves and others at their best" (Bushe, 1995). The two case studies below show the opportunities of using a consultative and collaborative model that focuses on a continuous evolution of strategies. As well as the apprentice, training plans may contain input from the vocational trainer, workplace, family, community, student, professional consultants, schools and the learning support team. They must be regularly updated and all participants kept informed. Traditionally, teacher activity is focused on the classroom and measured by student participation in assessable outcomes. It is hard to measure and report against the pastoral care aspect of the teaching role that is embedded within the framework outlined above.

Case Studies

Case history one: A lesson learnt, an apprenticeship lost

> Many learners view mathematics as a subject only of significance in the attainment of a qualification. They fail to value that maths as 'a product of human wisdom must also be a kind of civilization (Hirano & Kawamura, 2001).

Background

The apprentice is a 17year old male, undertaking a four year Certificate III in Diesel Fitting. He has a history of academic failure and prior to the apprenticeship undertook a ten month pre-vocational trade course, which developed practical skills but did not address educational deficits. Initially, the apprentice was a willing worker, who was liked for his happy and keen attitude. Although he undertook practical activities with seeming confidence, he failed to ask questions to clarify instructions and began secreting mistakes around the workshop. He failed to understand the relationship of theoretical tasks to practical application. He seemed so confident in the strategies of avoidance used in the past that our concerns were not relevant to his understanding of reality. The employer is a small, family owned manufacturing business that operates in a regional town with slim profit margins.

Identification

Early warnings included failure to complete training log book and activity diary, non completion of timesheets and workplace forms. An inability to apply the basic concepts of measurement and calculation resulted in failed assessment tasks at TAFE. The young man denied the scope of the problem and failed to attend organized tutorial support sessions and the offer of an educational assessment to identify learning needs.

Intervention Strategies

The Learning Support Teacher becomes the common thread within the communication network, and organizes an appropriate support system. The delivery trainer slowed the rate of instruction and spent extra time with the student in class and clear timeframes were developed. A tutor was assigned for the development of underpinning skills. Although the employer offered time off for tutorials, the apprentice attended one of six sessions.

Outcome

The outcome of an appreciative inquiry resulted in professional development of content trainers to identify literacy and numeracy skills embedded in assessment tasks. Training plans of pre-vocational students were checked to ensure literacy/numeracy pre-course indicators had been completed and acted upon. On return to the workplace a serious measurement mistake cost the employer a significant amount of money and the young man's apprenticeship was cancelled.

Case History 2: An Indigenous automotive apprentice

> The National Report to Parliament on Indigenous Education and Training (2001 p77) recommends that a training plan that attempts to strengthen literacy and numeracy skills for an indigenous learner must reflect respect and understanding of the learner as a culturally sited individual.

The Apprentice

The apprentice is from an island community in the Torres Strait, sited between Australia and Papua New Guinea. He is aged in the mid 20's. English is his third language. Attendance at school, though encouraged by family, was guided by community life of traditional hunting and fishing routines. The student identified he had a learning need to his Indigenous Employment and Training Support Officer (IETSO), who contacts T AFE. A precourse indicator shows lack of competency in fractions, ratios/volumes and poor reading skills, all needed at beginning of TAFE attendance.

The Workplace

The workshop has minimal equipment, much of it outdated and the workday consists of repetitive, predictable tasks on a small number of community vehicles. There is little scope for the apprentice to visit other workplaces or participate in industry trade days. The workshop supervisor is a mainlander on a yearly contract, and there are some issues with a seamless transition between contracts.

Organizational Response

As an organizational response a cohort of automotive apprentices from the Torres Strait is formed and a strategy developed that addresses educational and cultural needs. Previously students would attend based on stage of learning rather than community.

Intervention Strategies

An integrated VLLN program was put in place to meet the needs of this group. It included team teaching between a vocational trainer and literacy tutor. More experienced students were used as mentors. The pace of instruction was slowed down. Key concepts were repeated and industry specific language was reinforced. Students were offered out of class support, oral assessments and/or a scribe.

The apprentice met other students from his extended community who were involved in the same vocational package. He benefited cooperative learning where older members of the community upskilled younger men. Although instruction was in English, explanation from classmates was often given in Creole. The student also organized a short term work placement with a large employer who provided experiences not available in his home community.

Outcome

The strategy adopted here is now being applied to other trade areas.

Research findings – the story so far

The use of Appreciative Inquiry to investigate the needs of the struggling apprentice was an effective tool in gathering stories, bringing together networks and building bridges between the many players in the training plan to focus on the 'best of what is' with a view to guiding institutional change. The two case histories illustrate the need for appropriate student selection with due attention being paid to literacy and numeracy skills adequate to beginning competencies of the training package. Early intervention is the key to any strategy, and this is most effectively done if diagnosis of students' learning is done at commencement of training.

The adequate development of an ILP allows for flexibility in approach based on the student's need, encompasses the many players in the scenario as shown in the case studies above, and follows best practice principles of inclusion and professional teaching practice. For indigenous students, the research highlighted the need to integrate a culturally relevant approach that allowed some dominion over the learning experience.

Marr, Helme and Tout (2003) provide a model for building holistic competence looking at the complementary parts of the person allowing learning support to address the cognitive and affective elements at the coalface. The notion of providing an environment for the student to reframe themselves, from failure to competent, the building of a new identity with agency in numerical tasks is the challenge of the vocational trainers and learning support teams. In this instance, the model was expanded to an ecosystem incorporating and revealing the interrelatedness of the apprentice, the workplace, vocational training and learning support professional.

The Learning Support team does not operate in isolation. There is precious individual space in the lives of teacher, apprentice, employer and vocational teacher to provide room for the student to reframe self. The study reveals that space can be made when there is a shift in thinking. When relationships are formed with the external agents in an apprentice's life room can be found, sometimes it is as simple as rearranging the furniture, and sometimes it fails because a system cannot be budged, or the apprentice is not yet ready to undergo the personal journey involved in facing his/her learning demons.

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