Meeting Behavioural Challenges through Instructional and Assessment Methods in a Vocational Institute: A Comparative Study of Theory and Practice

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Introduction:

There are many theories proposed by different authors for teaching and assessing adult learners. Different theories can be applied in different scenarios for the individual learners as per the field of study. One of our program areas is Electrical Engineering in TAFE-SA. As the vocational education sector is different from the higher education sector, we wanted to know which of these theories are being put into practice by the teachers in TAFE-SA and the reason for selecting the methods. This paper will be focusing on meeting the behavioral challenges put forward by adult learners in vocational sector and the instructional and assessment methods selected by lecturers in response. We shall discuss the method selected to appropriately research and answer the questions. Through the data collected we shall discuss and analyse if the methods of instruction and assessment selected for practice follow what the theories propose.

Many questions are being researched to improve the learning outcomes of the students in different sectors and vocational sector is one of them. In the vocational education sector, it is essentially a competency- based training as compared to the curriculum-based teaching in the higher education. While it is relatively straight forward to understand and implement curriculum-based qualification, but when it comes to vocational-based qualifications there appears to be lots of ambiguity in understanding the requirements as well as how to implement them. The expectation by the industry is to recruit a trade person who can be employable. The training that is required to be given to meet the industry skills is as per the national Electrotechnology Training Package (UEE11).

We looked into the area of Electrical Engineering which is quite intense in theory using the concepts of mathematics and science extensively. At the same time practicals are critical due to the licensing requirements by the regulatory bodies to practice in this trade. The purpose of the study which is to find out the methods selected by vocational education instructors for instruction and assessment to meet the behavioural challenges in this sector and to streamline the research of this paper we would like to limit our case study to the following three questions relevant to TAFE-SA:

1) Since the behaviour of the students, both at the individual level and in a group make a significant impact on their ability to learn so the first question that the study answers is - Are the characteristics of the students in TAFE (Electrical program) similar to that of the known adult learners?

2) There is no specific method for delivery of the units of competency mentioned in the training package in vocational education. At the end of the study, the students are required to achieve the required competencies of the units. So, the second question is - How different are TAFE (Electrical program) instructional methods in comparison to the known theories?

3) In vocational education the selection of assessment method is left to the individual training organisation to work out. The assessment should satisfy the requirements given in the Elements and Performance Criteria, Required Skills and Knowledge, Critical aspects and the Range statement of the unit of competency. The unit of competency provides advice on assessment as per the Evidence Guide (UEE11). So, the third question that this study looks at is - How different are TAFE (Electrical program) assessment methods as compared to the known methods?

Method:

As the study focus is on the methods selected by TAFE-SA Electrical engineering sector, we would be interviewing two lecturers who have a vast teaching experience in this field. The questions have been designed to answer the criteria for selection of instructional and assessment methods to address behavioral problems and to compare if this pedagogic selection is similar in its practice to theory.

Since one of us is teaching in TAFE-SA, we decided to take a case study related to TAFE-SA and in the program area of 'Electrical Engineering'. We had approached the lecturers who are at senior levels, with many years of teaching experience and have a teaching qualification at AQF levels 6, 7 or 8. Since the lecturers' have a teaching qualification, we expected them to have a better understanding of their teaching practice as compared to those who do not have a similar qualification.

Of the two experienced lecturers that we approached, one lecturer (M) is teaching at AQF level-4 and the other lecturer (G) teaches at AQF levels 2, 3 & 5. M has completed an Associate Degree in Education and currently doing Bachelor's in Education. G has a Graduate Diploma in Education.

Interview Data: Data was collected through a questionnaire consisting of six questions as shown below:

1) What is your experience of facilitating adult learning?
2) What are your current challenges of facilitating adult learning?
3) Are the knowledge and skills that your students learning directly applicable outside the classroom, i.e. in real-life settings in general or in the workplace? Is there a gap between theory and practice or between academic exercises and
   real-life problems, do they see it as a major problem, and if so what could be done about it?
4) What instructional methods and methods of assessment are you currently using with the adult students and what is your justification for using such methods?
   How satisfactory are they in terms of meeting students' characteristics and needs, and in terms of promoting desirable types of learning processes and learning outcomes?
5) What would you love to incorporate in your practice that is missing in your current practice?
6) Any other comment you would like to make with respect to facilitation of lifelong learning?

Theories propounded and a review of the data regarding behavioural challenges:

Characteristics of adult learners according to Malone (2014, p.11). Malone contends that adult learners are self-directed and take responsibility of their own learning (2014, p.11). They have plenty of experience and like to connect the present learning with their prior experience. Adult learners are motivated to learn as it will be related to progression in career, skills development and professional development. They would like to learn only theory that is related to practical problems. Some adult learners may have not taken formal learning for a long time and may get intimidated. They have many responsibilities like job, running a family, children etc. Malone (2014, p.11) also says adult learners have some fixed habits and need time to reflect to enable change. *Facilitation is the most suitable style of learning for the adults.* Case studies, discussions, problem-based learning exercises, simulation are some of the learning strategies which can be useful for the adult learning. The adult learners like to be treated as equals. They expect frequent feedback to find out where they are going. Adult learners may appreciate some challenge beyond their present ability (Malone, 2014, p. 11).

What does the data say? Lecturer M's response to Q.2 of interview regarding the challenges of facilitating adult learning mentioned that he finds it challenging to keep the students motivated. Lecturer G said students are weak in mathematics and science. He also said that there is lack of discipline among the apprentices. These behaviours seen by the lecturers are against the theoretical characteristics of adult learners as self-motivated, as mentioned by Malone in the previous paragraph. The reason could be lying in the responses for the Q.3 regarding applicability of knowledge and skills, Q 5 regarding what else should be incorporated in current practice & Q 6 on facilitation of life long learning. Lecturer M said that he is required to cover theory of some obsolete equipment as per the training package. Lecturer G said that some (and not all) of what is taught is directly applicable to workplace. Though both the lecturers justified teaching, but the students may not have appreciated the requirement of understanding something which is not directly relevant to the real life. Students are being lazy for not overcoming the weakness of mathematics and science since the foundation skills lecturers are available for extra tutoring in TAFE-SA. We feel the lack of discipline among the apprentices is attributable to the young age profile as most of them are around 22 years of age. These students are also mostly school-leavers and probably still carrying the characteristics of the high-school.

Theories propounded and a review of the data regarding Instructional/ Teaching methods:

Facilitative teaching. According to Jarvis (2010, p.145) one of the aims of adult learning is to create autonomous learners. Adult learners would not like teacher-centred teaching techniques. The facilitators should provide an environment where the learning of the students' is assisted rather than dictated. The adult learners like to work at their pace, adopt to a learning style of their own, select certain part of the course to study and like the freedom to pick what to learn (Jarvis, 2010, p.145). Lecturer M uses facilitative method as per his response to the questionnaire for Q.2 regarding the challenges of facilitating adult learning and Q3 regarding applicability of knowledge and skills. He is allowing the students to study in their own pace. He still finds it challenging to keep them motivated due to the students'

multiple responsibilities of studies, family and work. This characteristic of multiple responsibilities is typical of adult learners as mentioned by Malone (2011, p.11).

Student-centred group teaching methods. Some of the students-centred approaches applied in TAFE-SA (Electrical program) are problem-based learning, projects and case studies and work-based learning. These methods are discussed in the succeeding paragraphs.

Work-based learning, which is a student-centred group teaching method. The learners get real life experience in this method of learning (Jarvis, 2010, p.169). Lecturer G teaches apprentices at certificate-III level, responded to Q.1 on facilitating adult learning said that after teaching the theory of a unit of competency, apprentices go back to work and are required to maintain a log- book profiling various activities that they undertake at their workplace. This is also an important evidence to get the endorsement of achieving competency in that unit.

Problem-based learning, which is again a student-centred group method of teaching. In this method the students are divided into groups to work on a problem usually given by the teacher. The students are expected to understand the problem and submit a solution in the form of report within a given timeframe (Jarvis, 2010, p.163). A variation of the Problem-based learning is practiced in TAFE-SA (Electrical program) for the vocational qualifications. Capstone for Certificate-III is individual student- based fault diagnosis exercise simulated to real-life problems. This is carried out individually by the future electricians since that is how they are going to operate in the workplace. Passing this test not only make the students competent as per the qualification but also gives them the required self-confidence to work independently said lecturer G in response to Q.1 on facilitating adult learning.

Project and case studies is a student-centred group method of teaching. Projects are done in groups and is therefore difficult to grade since grading is given at the individual level (Jarvis, 2010, p.164). One of the units 'Basic Programmable Logic Controller' is an elective in Certificate-III, IV and Diploma of electrical engineering. Three projects taken from real-life are included in this unit. Instead of group study, students do it individually. This makes it easier to grade and helps the learners in better understanding of the topics. Lecturer G teaches this unit of competency.

Teacher-centred teaching methods. Some of the methods implemented in TAFE-SA (Electrical program) are lecture, tutorial and demonstration. These methods are discussed in the succeeding paragraphs.

Lecture. This is a teacher-centred method of teaching. Bergevin *et al.* defined lecture as 'a carefully prepared oral presentation of a subject by a qualified person' (1963, p.157). This technique attracts criticisms but at the same time used widely. It is easy to implement because a lecturer can decide the content of the lecture to be delivered (Jarvis, 2010, p.151). Lecture is the dominant teaching method in TAFE-SA for the certificate-III units and Lecturer G mentioned it in response to Q.4 on instructional methods selected and the reason for those choices. According to lecturer G learners are young adults and are not sufficiently self-directed. As per Davies (1971, p.163) lecture can be useful for less capable adult learners.

Demonstration. This is a teacher-centred method of teaching. In this method, the teacher first demonstrates a procedure and then it is repeated by the students. This method is very useful in skills training (Jarvis, 2010, p.149). Both the lecturers, G and M said they use this method for the students while doing the practicals or if there are inadequate number of

equipment for the entire class. This method is necessary and the norm for TAFE-SA (certificate-III in Electrical) since Low Voltage activities are involved and they pose a safety hazard in form of electrical shock if proper care is not taken. Through demonstration the safety of the students is doubly ensured.

Tutorial. This is a teacher-centred method of teaching. As per Davies (1971, pp.167-168) tutorial can be in the form of group, practical or supervision. In group tutorials there are many students with one tutor (Jarvis, 2010, p.156). Lecturer G mentioned tutorial as one of the teaching methods employed by him response to Q.4 on selection of instructional method. He is involved in group tutorials as is the norm in TAFE-SA for 'certificate-III in Electrical'.

Theories propounded and a review of the data regarding Assessment methods:

Individual student-centred teaching methods/ Assessment methods. Some of the individual students-centred methods practices in TAFE-SA (Electrical program) are assignments, practicals, computer-assisted learning and self-directed learning. These methods are discussed in the succeeding paragraphs.

Assignments. According to Jarvis (2010, p.170) this is an individual student-centred assessment method. This is commonly used in most of the educational courses. Theoretical assignments can be in the form of essay writing, case study or a research-oriented project work. The advantage of a teacher setting the assignment is that the entire syllabus is covered and the grading is standardised for all the students (Jarvis, 2010, p.170). Lecturer M uses paper-based theory assessments.

Computer-assisted learning. This is an individual student-centred assessment method. This facility is present in most of the institutions to assist in adult learning. One such example is the e-learning (Jarvis, 2010, p.172). Lecturer M has developed some e-learning tools response to Q.1 on facilitating adult learning. In response to Q 4 on selection of instructional methods, he said that he is also delivering theory by distance education and uses partially online platform for assessments. Lecturer M has conducted simulated work environment training. E-learning is mostly used at higher qualifications of level-IV and above in TAFE-SA (Electrical program). It is also used for some simple topics at lower levels of qualifications.

Practicals. This is an individual student-centred assessment method. This method is used to teach practical skill. Students practice the skills in a simulated environment. Practicals are carried out in a laboratory (Jarvis, 2010, p.175). Both the lecturers (M & G) are involved in carrying out assessments in the form of practical exercises. Lecturer M has conducted simulated work environment training as he stated in response to Q.1 on facilitating adult learning. Lecturer G mentions about more effort being made to increase the practical tasks. Since work of the 'Electricians' is licenced, they learn the hand skills through practicals in the workshop under supervision.

Self-directed learning. This is an individual student-centred teaching method. This is an important teaching method. Brockett and Hiemstra (1991) consider self-directed learning as a development from andragogy. In this the individual is treated as an autonomous learner. As per Jarvis (2010, p.177) the degree of autonomy varies. Candy (1991, p.15) explained 'autodidaxy' as self-directed learning taking place outside a teaching institution. In this the autonomy of the individual is ensured. One type of self-directed learning is by distance education where the students are not within the physical presence of the teachers. In this

also there is no absolute autonomy (Jarvis, 2010, p.177). Lecturer M is delivering theory by distance education according to his response to Q.4 on selection of instructional methods.

Reflective Discussion:

Reflection on the first question of the case study: Are the characteristics of the students in TAFE (Electrical program) similar to that of the known adult learners?

The adult learners are expected to be motivated, self-directed and learn well when the theory is associated to the real-life (Malone, 2014, p.11). On the contrary lecturer M found it challenging to keep the students motivated for Certificate-IV qualification even though he uses facilitative teaching method. This can be due to the multiple responsibilities of the students towards the family, work and studies. As per Malone (2014, p. 11) the characteristic of multiple responsibilities is typical of adult learners. We found the case of multiple roles is mostly applicable for matured learners and they are able to self-manage the responsibilities since the qualification which they are studying would be related to progression in career. However, lecturer G finds discipline among the young apprentices as an issue. Our understanding is that these are young adults and still not matured enough to discipline themselves. The disciplinary behavioural aspect can impact the students' performance and slow down the learning process.

Reflection to the second question of the case study: How different are TAFE (Electrical program) instructional methods in comparison to the known theories?

Due to the mandated requirement to comply with the training package, some gaps in learning may take place in that there is theory of operation of some pieces of equipment that are no longer used in industry. However, lecturer M said that the theory is interesting and forms a basis of further learning and shows the development of technology over time in response to Q.3 regarding applicability of knowledge and skills. Lecturer G is of similar opinion. He said that some of what is taught is directly applicable and some is necessary knowledge that creates understanding of why things happen the way they do in his response to Q.3 regarding applicability of knowledge and skills.

Lecturers (M and G) are using multiple teaching methods both student-centred and teacher-centred. Student-centred group methods (which are preferred for the adult learners) being implemented are work-based learning, variation of problem-based learning, variation of project studies, distance education and computer-assisted learning. Variation of the problem-based learning is undertaken by taking the students through fault-diagnosis individually as opposed to working in a group to enable the students to work independently as an electrician. Similarly, variation of the project studies is done in some units of study by making the students work out the solution individually as opposed to a group. This not only makes it easy for marking the students individually but also pushes the academically weaker students to work towards a solution. We have observed that in a group activity some students dominate and overshadow the quiet and academically weaker students.

Due to certain expectations of the Employers and the Training Organisation, it is not possible to provide complete freedom to the students while learning even in the facilitation method. These expectations are laid down in the contract of training and are in terms of completion of training within a timeframe or at certain times of the year as is the case of the apprentices. It

is because from the organisation point of view the courses are required to be run in an economically profitable manner to justify the employment of various resources including lecturers. From the self-directed mature students' point of view, we have observed that given an open-ended finish time, most of the students prolong the completion of their studies due to their multiple responsibilities. Lecturer G has expressed frustrations due to his inability to do more but unable to do due to organisational constraints.

Also, some of the teacher-centred methods are applied in the form of lectures, demonstrations and tutorials. The teacher-centred methods though not preferred for adult learners, are still applied for the young apprentices because these methods can be useful for less capable adult learners (Davies, 1971, p.163). In the case of the demonstrations, it is the safety aspect of working with live low voltage that is justifying the selection of the method.

Reflection to the third question of the case study: How different are TAFE (Electrical program) assessment methods as compared to the known methods?

The assessment methods used by the lecturers M and G are assignments, online assessments and practicals. Practicals are important part of assessment in Electrical engineering as it helps them accomplished in the hand skills. These assessments are carried out and marked individually as per the suggested methods by Jarvis (2010, p.170). These methods support the requirement of the training package to ascertain the competency of the learners individually.

Conclusion:

Some of the characteristics of the adult learners were found to be lacking in the students studying in TAFE-SA (Electrical program). Motivation was less in the mature age students due to the multiple responsibilities at home, work and studies but the incentive of advancement in their career kept them on the track of pursuing learning. Young adults cause disciplinary problems and could be attributed to the lack of maturity after leaving school.

Various teaching methods are being used in TAFE-SA (Electrical program). Besides the widely accepted student-centred methods for the adult learners there are some teacher-centred techniques also in use. The teacher-centred methods are primarily for the less capable young adult learners like the cohorts of apprentices. Due to certain expectations of the Employers and the Training Organisation, it is not possible to provide complete freedom to the students while learning even in the facilitation method.

The assessment methods applied in TAFE-SA (Electrical program) is in conformity with the methods mentioned by Jarvis (2010, p.17) and this also complies with the requirements of the training package.

We have seen that some of the students return to study further after their initial vocational qualification (Certificate-II to III or Certificate-III to IV / V/ VI). This goes on to show that those students are on their way to achieving 'Lifelong learning'.

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