

Instructional intelligence, professional development and VET teachers: A mixed methods study of educational change

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Abstract

In the Australian vocational education and training (VET) sector teachers are drawn primarily from industry and work in a system which appears to privilege vocational expertise over that of teaching expertise. Debate surrounds the adequacy of the benchmark VET teaching qualification (Certificate IV in Training and Assessment - TAA40110) and many argue that qualification and professional development in the sector are preoccupied with promoting VET system compliance instead of teaching capability.

This study examines the effects of a systemic change professional development program for VET teachers in the Technical and Further Education (TAFE) system in Western Australia. Designed to refine and extend the instructional practices of VET teachers, the Instructional Intelligence Professional Development Program took place over four years. In examining its effects, a sequential mixed methods approach was used. Findings revealed that teachers' beliefs and instructional practice changed as a result of the program. Further, teachers reported that their use of new instructional processes had a positive impact on student learning.

These findings have the potential to inform the future design and implementation of professional development programs, contribute to the debate on the pedagogical requirements for VET teachers and contribute to a growing body of research on instructional intelligence.

Introduction

VET teachers are drawn predominantly from industry, and enter a system where their vocational (industry-related) skills and knowledge are held in high esteem. Teaching qualifications are not a pre-requisite for employment and the current requirement is that teachers acquire the benchmark VET teaching qualification – Certificate IV in Training and Assessment (TAA40110) within the first two years of service, usually whilst teaching. Debate surrounds the adequacy of the TAA to equip VET teachers with the requisite pedagogical skills and knowledge to meet the increasing diverse needs of their learners (Bound, 2011; Clayton, 2008; Guthrie, 2010; Robertson, 2008 & 2009). Some argue that ongoing professional development provision in the sector is preoccupied with promoting system compliance and implementing VET policy instead of developing pedagogical and instructional capability (Harris, Simons, Hill, Smith, Pearce, Blakeley, Chjoy & Snewin, 2001; Perkins, 1997; Schofield & McDonald, 2004).

If the purpose of VET is to equip individuals with vocational skills and knowledge to gain nationally recognised industry qualifications, we can surmise that effective teaching and learning must occur to enable these outcomes. However, issues surround the TAA and professional development provision in the VET sector and resulting in conflicting messages about the importance of instruction, pedagogy and the role and status of VET teachers.

Major reform is planned for the Australian VET system, new enrolment targets require a 3% growth per annum up until 2020 and there is a greater focus on increasing participation in VET amongst school aged, migrant, Indigenous, disadvantaged and disengaged learners. It would be reasonable to assume then that VET teachers will need a comprehensive range of instructional methods, which they can use wisely and confidently to meet the complex needs of an increasing number of diverse learners. As the federal government considers the implementation of a \$240 million dollar workforce development strategy for the tertiary sector focused on VET professionals (Skills Australia, 2010) it is timely for us to consider what strategies best support teachers in acquiring new, or refining existing, instructional knowledge and skills. Equally, it seems an opportune time to consider how the improvements in practice VET teachers make can be collectively sustained.

In this paper I consider these issues and describe the effects of a four year systemic change professional development initiative for VET teachers working in the Western Australian Technical and Further Education (TAFE) system in the area of *instructional intelligence* (Bennett, 2002 & 2010; Fullan, 2001). In examining the program's effects this study aims to discover, 1) the extent to which the program has been successful in changing teacher's instructional practice and beliefs about instruction in VET; and, 2) the extent to which teachers found new practices relevant to their students' learning needs.

Literature review

VET teachers

Whilst it is acknowledged that VET workforce data can be contradictory and at times problematic, a recent report by the Productivity Commission estimates that the total VET workforce numbers about 223 000, with approximately 73 400 working in Technical and Further Education (TAFE) and another 150 000 workers involved in VET delivery by private Registered Training Organisations (RTOs) (Productivity Commission, 2011). It is well documented that the VET sector has an ageing workforce, with data from the Productivity Commission estimating that in 2010 the average age of VET teachers was 49 years in the TAFE sector and 44 years in the non-TAFE sector which compares with the average age of all Australian workers of 40 years. This is unsurprising given most teachers come to VET teaching as a second career, after working in their chosen vocational field first.

Defining the role of the VET teacher and delineating between the roles of industry expert and educator has been debated by numerous researchers and the need to clarify the nature of the VET practitioner's role has long been a site for tension and slippage (Chappell, 2002 & 1999; Guthrie, Perkins, & Nguyen, 2006; Rumsey, 2002, Smith, Lowrie, Hill, Bush & Lobegeier, 1997). This debate has given rise to claims amongst researchers that VET teachers have a *fractured* identity – suggesting they are torn between the role of industry expert and that of professional educator (Chappell 2002; Guthrie, 2010; Robertson, 2009).

VET context and teacher qualifications

Debate over the provision, suitability and structure of VET teaching qualifications has intensified sharply over the past few years. As outlined, VET teachers operate in an increasingly complex and demanding teaching environment characterised by multiple delivery contexts and modes. Much has been written about the adequacy and suitability of the Certificate IV in Training and Assessment to equip VET teachers with the necessary skills and knowledge to teach an increasing diverse and demanding clientele. Wheelahan (2010) notes that VET teachers are required to teach in more composite and diverse environments than their counterparts in schools and universities and Clayton

(2009) citing research conducted by Mitchell (2008) and Guthrie et al (2006), argues that there is evidence that they need “high level pedagogical capabilities.” (p. 12).

Despite this, many argue that the VET system continues to privilege the role of industry expert over that of teacher and the systems and process that teachers interact with re-enforce this message. For example, competency based training (CBT), and training package design, fundamental tenants of the system are concerned with what a student will be able to know and do at the end of training – with little emphasis on inputs or the process of how students get there (Hodge, 2009; Schofield, & McDonald, 2004; Smith & Keating, 2003). Bound (2011) and Robertson (2008 & 2009) observe that there is a strong focus on the vocational expertise of VET teachers and in comparison little attention is given to instructional practice or theories of learning with much of the content in the TAA focused on system compliance; with Robertson claiming the TAA “doesn’t provide the opportunity to develop pedagogical content knowledge,” (2009, p.5) an observation also supported by Clayton, (2009), Hodge, (2009) and Wheelahan (2010). In the absence of explicit guidance and training in instruction teachers adopt pedagogical and instructional practices that align with their personal beliefs, values and experiences as learners at school and as apprentices and trainees (Bound, 2011; Robertson, 2009). Given this situation - are VET teachers ever likely to develop the “high level pedagogical skills” required for the complex demands of the current VET environment?

Professional development provision for VET teachers

Professional development activities in the Australian VET sector are predominantly designed to meet priority skill needs, often linked to implementing aspects of the national training system and responding to system compliance issues (Schofield & McDonald, 2004). Wheelahan and Moodie (2010, p. 49) found that the majority of programs in VET are ‘event focused’, rolled out as ‘just in time’; they are designed to meet the latest VET policy revision (Guthrie & Clayton, 2010; Harris et al, 2001; Perkins, 1997). Funding models also largely reflect this short-term perspective, providing seed funding to individual projects which fail to support any long-term systemic embedding of new skills and knowledge (Harris et al., 2001; OECD, 2008, 2009). A significant body of research supports the view that short-term approaches focused on promoting the latest political initiative work against building emergent practices; a critical design flaw when attempting to initiate and embed long-term sustainable change (Cort, Harkonen & Volmari, 2004; Dickie, Eccles, Fitzgerald, McDonald, Cully, Blythe, Stanwick & Brooks, 2004; Forewood, Mclean & Butler, 2001; Guthrie, 2010; Guthrie & Clayton, 2010; Harris et al., 2001; Villegas-Reimers, 2003; Wheelahan & Moodie, 2010; Wilson, 2003).

Method

The instructional intelligence professional development program

The Instructional Intelligence (II) Professional Development Program ran for a period of 4 years, (2005–2008) and was designed to extend the instructional repertoire and expertise of VET teachers. The system-wide program was initiated in response to a change in Western Australian (WA) state legislation which raised the school leaving age from fifteen to seventeen years. As an increasing number of young students entered a principally adult learning environment, many of them reluctantly teachers and TAFE management made requests to the WA Department of Education and Training (WADET) for support to acquire new or upgrade their instructional skills to successfully engage and manage this cohort.

Instructional intelligence (II) was developed by Barrie Bennett (Bennett 2002; Fullan 2002; Bennett 2010). Bennett has progressively developed the concept over the past thirty-six years of his own teaching, research and work with teachers. He describes II as the point at which the art and science of

instruction meet. In describing the *science* component of II, Bennett refers to it as the way in which teachers pay attention to the research on the impact of using different instructional methods on student learning - in this context effect size. By stacking and integrating different methods the aim is to create the most powerful learning environments for students. *Art* is the creative and individual way in which each teacher will stack and integrate different instructional methods to suit different groups of students. By increasing teachers' instructional repertoire Bennett argues; "we are more likely to become artful or creative and more scientific or intentional when differentiating our instruction to meet the diverse needs of students." (2010, p. 69).

Central to the concept of II is helping teachers better understand and work effectively with change and this was reflected in the design and implementation of the program. Developing instructional intelligence involves more than teachers simply collecting an extensive assortment of instructional methods in that developing expert behaviour in the use of any new skill takes time and practice. The program was based on research and theory into educational change (Fullan 2001; Hall and Hord 2006; Huberman 1983) and effective staff development (Bennett 1987; Joyce and Showers 1995; Joyce and Weil 1996; Huberman and Miles 1984), which recognises that change occurs over time and is a developmental process, and effective staff development occurs when individuals work in teams, have opportunities to practice and reflect on their progress and receive constructive feedback and coaching.

Program participants attended the II professional development workshops in college-based teams comprising between two to four individuals. Over the 4 years of the program, workshops were held two or three times a year with each session running for three consecutive days. At each session, participants engaged with theory and research on a selected range of instructional innovations. The steps involved in implementing the innovations were modelled and participants practiced them and received feedback and coaching on their progress. Participants then considered the process and impact of integrating innovations across different content domains and with different cohorts of students. When they returned to their colleges the teachers were required to trial the instructional methods in their classrooms, reflect on the process and meet in their teams to discuss progress and provide support using peer coaching methods. In this sense, the professional development program involved a complex and lengthy journey of instructional change for participants. The process was highly interactive and involved teachers seeking to make change in different contexts with different people.

Research participants

There are 11 publicly funded VET providers in WA comprising 10 colleges and a VET centre with over 50 campuses situated in metropolitan, regional and remote locations. All research participants in this study worked in the public VET system and were recruited from the group of 35 VET teachers in the II professional development program. A total of 27 teachers volunteered to take part in this research. This group is broadly representative of VET teachers in the state, working across diverse vocational areas including: adult literacy; business studies; graphic design; metal, mining and engineering trades; building and construction; and community services.

Participants comprised 8 male and 19 female teachers and were distributed across the 11 sites in metropolitan, regional and remote locations. Fourteen participants were from regional colleges, four were from remote locations and nine were from metropolitan colleges, the sample is approximately evenly spread across the geographical distribution of colleges. Participants' varied in their teaching experience and the number of years they had participated in the program. The majority of the sample could be described as experienced, with 17 having eleven years or more teaching experience; six of this number had been teaching for over twenty years. Out of the remaining 10 participants, two had

been teaching for between one to four years and eight for between five to ten years. Seventeen out of the 27 had participated in all 4 years of the program, four for three years and six for two years.

Research design

A mixed methods approach informed the choice of data collection and methods of analysis. Drawing from varied sources of data affords opportunities to recognise and examine the complex nature of the change process which occurs over a period of time. Adopting a mixed methods approach also allows for the triangulation of data, which can work to address any potential weaknesses that may be inherent in a single method approach and provides opportunities to test the consistency of research findings (Johnson & Onwuegbuzie, 2004). The design incorporated four sequential phases, employing quantitative methods for the identification of meaningful patterns followed by qualitative methods for gaining insight into more complex experiential phenomena (Greene & Caracelli, 1997). Analysis involved the application of descriptive statistics for quantitative data, and narrative and interpretive analysis for qualitative data.

Data collection and analysis

Phase One

Phase one comprised the administration of the Concerns Based Adoption Model (CBAM) instruments, The Stages of Concern Questionnaire (SoCQ) - a 35 item questionnaire, and Levels of Use (LoU) interview protocol. To ensure consistency in the focus of responses across the two instruments participants were asked to select a single innovation acquired through the professional development program and respond to the SoCQ and LoU interview based on their implementation experiences.

Data were analysed to identify relationships between individual LoU and Stages of Concern (SoC) scores and to identify relationships to the overall group profile. Associations between the different LoU and SoC groupings were examined and used to identify cases that could provide rich sources of data, allowing inquiry to focus on the relationships between individuals and the systems in which they work. A total of 8 cases were identified from the group and were representative of low, medium and high LoU and different SoC. A total of 8 individuals were identified and this group progressed through the remaining phases of data collection.

Phase Two

In order to discover more about the reasons for the 8 individual profiles and placements narrative methods were used in this phase of data collection. Connelly & Clandinin (1990) and Riessman (1993) suggest that encouraging individuals to re-tell personal stories and discuss the meaning of these experiences for them allows freedom of expression and in-depth disclosure at a personal level.

Individual in-depth, open-ended interviews were conducted each lasting for approximately 60 minutes. Participants were invited to share personal experience stories (Clandinin & Connelly, 2000) in which they focused on episodes they felt best described their experiences of the change process associated with professional development. Interviews were audio-recorded, raw data were transcribed and remapped by the process of restorying (analysing and reconstructing the original story using a pre-determined framework). Clandinin and Connelly's (2000) three dimensions of interaction, continuity and situation were applied, providing a three dimensional structure to the narrative which allowed individual journeys to be tracked over the life of the professional development program.

Phase Three

This phase involved observing the participants in their classrooms whilst they used the instructional innovation they reported on in first phase of data collection. Field notes were taken and data were recorded against rubrics. Rubric descriptors were devised based on the critical attributes for each

innovation at four distinct levels of performance, these levels consisted of – level 0 (No use), level 2 (Mechanical use), level 3 (Routine use) or level 4 (Refined use), participants were ranked at one of the four levels. The data were compared against that of earlier stages to better understand the connections between self-reported data and observed levels of use.

Phase Four

One week after the classroom observations a final semi-structured interview was conducted. This provided participants with the opportunity to reflect on their practice during the observation and to share feelings about the process and their level of use on the day. Data were transcribed and then analysed using thematic narrative analysis and compared with that gathered from the previous phases of collection.

Limitations in the design and analysis

It is acknowledged that this study has limitations. Firstly, data collection was conducted at the end of the four year professional development program and provides a cross-sectional ‘snapshot’ of the group at a particular point in time. There is no way of accurately tracking the development of individuals or the group over a period of time. Secondly, despite anecdotal evidence from the teachers regarding the impact of their use of new instructional methods on student interaction, engagement and academic performance, data was not collected from students and it is not possible to corroborate the teacher’s assertions with such data. Finally, it is also acknowledged that the participants who volunteered to take part in this study were motivated to do so and it is not surprising that they are implementing aspects of the program, there is no way of knowing what the remaining number experience.

Findings and discussion

Stages of Concern questionnaire (SoCQ)- Peak Score Analysis

Analysis of the SoCQ responses revealed that the modal stage of concern for the sample was Stage 5 – Collaboration. Twenty out of 27 individuals (74%) of the group held peak Stage 5 concerns indicating that at the end of the program the majority of the group wished to collaborate with others with regard to their use of the innovation. Collaboration concerns are classified as *impact* concerns and indicate that the individual has moved beyond initial *self* and *task* concerns and is now focused on working with others and sharing ideas to continue and improve their use. Table 1, displays the frequencies and percentages for the highest Stages of Concern for the group.

TABLE 1: Frequencies and percentages for highest stages of concern for the study group.

<i>Highest stage of concern</i>	0	1	2	3	4	5	6	Total
	<i>Un-concerned</i>	<i>Infor-mational</i>	<i>Personal</i>	<i>Manage-ment</i>	<i>Conse-quence</i>	<i>Collab-oration</i>	<i>Re-focusig</i>	
Individuals (n)	0	0	4	2	0	20	1	27
Individuals (%)	0	0	15	7	0	74	4	100%

When examined in relation to the developmental dimension of the SoC framework, these findings also provide information about the design and implementation of the II professional development program. CBAM literature (Hall & Hord, 2006) suggests that if an innovation is appropriate and the change process is facilitated wisely over time then implementers will move from early *self* concerns (Information and Personal) to *task* (Management) concerns within 3 years. Between 3-5 years they will progress to *impact* concerns (Consequence, Collaboration and Refocusing). For the majority of the group to have developed to this Collaboration Stage “means that change has truly been treated as

a process, that the innovation has been given sufficient time to be implemented” (Hall & Hord, p. 150). The peak scores for the remaining 26% of participants - those other than reported at Peak Stage 5 were as follows;

Stage 2 – Personal, 15% (4 individuals)

Personal concerns are related to the *self* and indicate uncertainty about the demands of making change and how this relates to the teachers’ role and status in the organisation. Hall and Hord (2006) state that Personal concerns indicate that individuals are concerned about potential conflicts which may arise with existing structures as they begin to use an innovation.

Stage 3 – Management, 7% (2 individuals)

Management concerns are classed as *task* concerns and show that the individual is focused on the processes and steps related to using an innovation. Issues relating to managing time, resources and logistics related to the innovation are of primary importance to these individuals.

Stage 6 – Refocusing, 4% (1 individual)

Refocusing concerns are *impact* concerns and indicate that the individual is focussed on exploring new ways of using an innovation. This may include the possibility of making major changes to it or replacing it entirely. Individuals at this stage often have very clear ideas about alternatives to the current form of the innovation and are looking to change.

Levels of Use (LOU) Analysis

There are three distinct groups within the sample (Table 2). Group characteristics were defined using the CBAM user profile descriptions and are elaborated below.

LoU IVA – Routine - 11 individuals (41%)

These individuals have established a regular pattern and routine way of working with the innovation. They have mastered the innovation and its use and there are no plans to make any adaptations or changes, use has stabilised.

LoU IVB – Refinement - 14 individuals (52%)

This group has conducted some type of formal assessments on their use of the innovation and is now considering making changes and adaptations in order to increase student outcomes. These individuals must have changed within the past 3 months, be planning a change, or be in the process of changing or evaluating.

LoU V – Integration - 3 individuals (7%)

These individuals are initiating changes in the innovation based on input from and in coordination with others. They have moved beyond their own use to work with others for the purpose of increasing student outcomes.

TABLE 2: Levels of use amongst the group

	<i>0</i>	<i>1</i>	<i>II</i>	<i>III</i>	<i>IVA</i>	<i>IVB</i>	<i>V</i>	<i>VI</i>
Level of Use	Non - Use	Orient- ation	Prepar- ation	Mechan- ical	Routine	Refine- ment	Integra- tion	Renewal
Individuals (n)	0	0	0	0	11	14	2	0
Individuals (%)	0	0	0	0	41	52	7	0

Narrative interviews

Beliefs about instructional practice

All of the 8 participants who took part in the narrative interviews told stories of how their experiences on the program led them to question and in some cases alter their perceptions and beliefs about instruction. One participant who had been teaching in VET for 15 years revealed the impact the program had on her and the way she now views her instructional practice; *it's in me and I just won't change, I believe in it, it's like a belief system.*

When reflecting on his professional development experiences another participant commented; *I still see it as a journey and it's like part of my repertoire now. I don't use it all the time but then again when I do it works, I know who I am using II.*

Another participant noted; *every time now when I prepare for a lesson I'm no longer thinking purely content, yes I'm thinking content of course but the first thing I think of is 'which one of the concepts will I use... I could use a placemat for this, I could use a Venn Diagram for that, could I use community circle and why would I use it – what's the purpose?'. I've completely shifted my thinking on how to prepare for a lesson.*

Impact on student learning

Participants reported increased levels of student engagement and on task behaviour, higher levels of student interaction through the use of cooperative group structures and a reduction in the number of behaviour management disruptions.

The process of implementation in the classroom was not always smooth as one participant recounts; *There was the stress of getting thorough the timeframe, 6 weeks to get through content and I was worried trying new things would waste a session and I did end up wasting a session because it took me more time than it would normally.* However, long term benefits were to be had as she became more instructionally skilled over time; *The great thing now is when teaching the same course with the same cohorts of students I'm actually 2 weeks ahead of schedule, they really get into it. They go to places they would never have gone to before. The instructional processes I use really push them and what's even better is they actually enjoy it.*

Another teacher spoke more broadly about the role of her use of II in VET; *I'm also really worried about the quality of the education and training in my sector and I truly believe that we can do a much better job and this is one way in which we can do a better job. I have children and I want them in the best system that gives them the best opportunities to learn and this helps you do that.*

Classroom observations

Results from the classroom observations revealed that the participants were implementing the innovations at the self reported LoU placing.

Conclusion

The purpose of this study was to discover, 1) the extent to which the Instructional Intelligence Professional Development program has been successful in changing teacher's instructional practice and beliefs about instruction in VET and 2) the extent to which teachers found new practices relevant to their students' learning needs. Findings from this study lead to the conclusion that the program and the way in which it was implemented was successful and relevant to VET student learning needs.

Findings from the LoU interviews and the classroom observations confirm that participants have changed their instructional practices as a result of the program. When analysed in relation to the CBAM framework findings reveal the majority of the group is ahead of what the change literature predicts after 4 years of implementation. In this sense the program has been effective.

Narratives from the in-depth interviews provide insights into changes in teacher beliefs about instructional practice in VET. Comments such as; *I know who I am when I use II*, and, *it's in me...I believe in it*, are indicative of the internalisation of beliefs about the value of instructional intelligence and their role as VET teachers. Cross and Hong (2009) suggest that teachers' professional identity is fundamentally grounded in personal belief systems and can be understood as "a framework established and maintained through interaction in social situations, and negotiation of roles within the particular context." (p. 278). For the VET teachers in this study their professional identity is closely linked to that of teacher.

All the participants involved in the in-depth interviews report that they found the application of instructional intelligence in their teaching contexts to be relevant to their students' learning needs and in one case the teacher states her use of certain instructional processes accelerated student learning and completion time.

Implications

As the federal government considers its investment in the tertiary sector it is appropriate to consider the skills required by teachers in the current VET environment. Who better to contribute to the debate on what is needed for them than those who carry out the work on a daily basis – VET teachers.

Vocational skills are important but so are the skills that are needed to teach them, both need to be equally valued. VET systems and processes place considerable emphasis on assessment and have done for many years it is time for an equal emphasis to be placed on instruction. It is time to re-connect learning and assessment as a process in VET and acknowledge them as integrally linked.

Given most VET teachers enter the sector with little or no instructional skills and knowledge the explicit development of these is important. Findings from this study support the view that instruction has a valuable place in VET for both teachers and learners and further reinforce claims for it to be integrated into initial VET teacher training qualifications and current provision of in-service professional development. If provision needs to expand to include instruction so too does the design and implementation of professional development models (Saunders, 2011). Current trends to provide one off – just-in-time or short sessions without providing long term opportunities for teachers to trial, reflect, discuss and refine their skills over time typically has weak effects. This study shows that when professional development is structured and implemented over time and supported appropriately, sustainable change in teacher practices and beliefs can, and do occur.

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