TENSIONS IN TEACHER PROFESSIONAL DEVELOPMENT

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ABSTRACT

In this time of evolving demands on vocational teachers to use flexible delivery methods through the use of information and communications technology professional development can be adhoc and disparate. This paper identifies and analyses the tensions experienced by one group of trade teachers as they work towards developing ICT resources for flexible delivery. The theoretical framework draws on Marx's conceptualisation of the social relations of production; the ways in which tools such as ideas about teaching and learning, ICT knowledge and skills are consumed or used by teachers and their access to them. It is argued that context in the form of policies, historical practices, discourses and mode of production are embedded in the tools, contributing to tensions in the activity of producing ICT resources.

1. INTRODUCTION: EVOLVING DEMANDS ON TRADE TEACHERS PROFESSIONAL DEVELOPMENT

The increased pressure on vocational teachers to use flexible delivery methods means it is increasingly urgent to develop better understandings of how the use of ICT mediates teacher practices. In the trades, apprentices traditionally attended face-to-face sessions on campus in two to four week blocks of time, with the remainder of their time working on the job. Recent policy changes (Australian National Training Authority (ANTA), 2001 Department of Education Science and Training (DEST), 2002) and skill shortages have increasingly seen trade teachers move to assessing apprentices on-the-job, and using flexible delivery methods including the use of information and communications technology (ICT). Trade teachers are faced with considerable challenges in meeting these changing needs.

The use of ICT instruments by vocational education and training practitioners is identified as a key staff development priority, for practitioners both internationally and nationally (Loveder, 2005). In Scandinavian countries, the United States and Australasian countries teaching and learning methodologies in relation to ICT instruments are becoming 'increasingly important' (Loveder, 2005, 6). This priority is reflected in the recognition of the challenges and issues facing vocational education and training practitioners in keeping pace with changing work practices and changing skills demands for the workforce they train (Curtain, 2004; Loveder, 2005; Trood & Gale, 2000). As the Organisation for Economic Co-operation and Development (OECD, 2004, 11) notes, the use of ICT has been seen as an integral part of a strategy to improve teaching and learning. As with other OECD countries, Australia has seen a strong policy push for the use of ICT in the delivery of VET.

In this time of evolving demands on trade teachers', professional development for these teachers can be adhoc and disparate. Institutions embrace government policy changes, develop a language and rhetoric around the new policies, such as the move to flexible delivery and the use of information communications technology

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(ICT), and put in place *some* support to implement the new policy direction. However, it is not unusual for institutions to be unable to identify and work through the day-to-day implications of major changes in direction. In this paper it is argued that tensions and contradictions are an inevitable part of any change activity, and are expressed in the social relations of production (Bound, 2007). It is further argued that the social relations of production are imbued with contextual conditions expressed through the language of policy, major discourses and the history of previous relations of production (Bound, 2007).

Key questions include, how, for example, the use of ICT changes the pedagogical roles of teachers and in turn their practices (McLoughlin & Oliver, 1999 in Webb & Cox, 2004) or how ICT can provide very different learning opportunities (Corna 1996 in Webb & Cox, 2004). In the vocational education and training sector there is only limited awareness and knowledge of this territory (Kilpatrick & Bound, 2003). There is a growing body of research into teacher pedagogy (teaching and learning philosophy and practices) when using ICT instruments. Understanding the relationships between teachers' pedagogies and how their pedagogical reasoning develops when using ICT is, however, yet to be mapped fully (Webb & Cox, 2004).

This paper traces the experience of a group of trade teachers working in a public sector institution in a small Australian state implementing recent government policy of flexible delivery and the use of ICT to deliver learning. This group of teachers have taken a distinctive approach, which aims to enhance flexible delivery while maintaining and improving the quality of learning. The project involves the teaching team working in conjunction with the Institution's learning management team and two researchers (the authors). The research team recognizes the need for the teachers to be active participants in many aspects of the change process, to provide opportunities for the teachers to develop their thinking about learning styles and approaches, and for the teachers to have greater control over the ICT resources and materials embedded in the program. Towards these ends a community of learners approach was adopted, in which the team of teachers, the flexible delivery management team, and the researchers collaborated in the development of new ICT resources as part of the implementation of flexible delivery. The teachers are the key drivers in designing, producing, and implementing the learning technology materials.

2. THE EMBEDDEDNESS OF CONTEXT AND TENSIONS IN THE SOCIAL RELATIONS OF PRODUCTION: THEORETICAL AND CONCEPTUAL BACKGROUND

Context is inherent within the social relations of production. In this paper context is framed as 'contextual conditions'. The term 'contextual conditions' was derived from what Marx referred to as the political economy, referring to the social, political and economic relations of society. Ilyenkov (1960) drew on the work of Marx who claimed that human thought and action are *conditioned* by the relations of production they interact with. Marx explains that 'man' (sic) belongs 'to a particular social formation, a class, a nation, a historical epoch and is therefore *conditioned* by the totality of these circumstances in his (sic) mode of behaviour, possibilities, needs and decisions at any given time but it is also 'man' who changes circumstances (Fischer, 1968, pp. 155–156). Although Marx was referring to historical epochs, Bound (2007)

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argues that the concept of being conditioned by our circumstances is applicable at all levels of activity. In her doctoral thesis Bound (2007) argues that these conditions both mediate and are mediated by activity; they are part of the social, political, economic and environmental relations of society. The conditions identified by Bound (2007) are, mode of production, history, dominant discourses, government policy, stage of industry development, infrastructure and arrangements between institutions. Relevant to this paper are the conditions of policy, discourses, history and mode of production. The ways in which these conditions are evident in the social relations of the activity of trade teachers in this case study is discussed in the section, 'Contextual conditions embedded in the social relations of the teaching team'.

An activity theoretical perspective informs us that tensions and contradictions increase as conditions change (Engeström, 2000). Engeström (2000, p.153) notes that, "If actors are able to identify and analyse contradictions of their activity system," they may resolve these contradictions and expand the activity system. What then, is meant by tensions and contradictions in activity? Contradictions are structural tensions within and between activity systems (Engeström, 1999, p.5). For example, if a new tool is introduced to the activity, this may change relations resulting in a need for different allocation of authority and skills, which may result in tensions between the old but continuing division of labour and the new tool. In order to better understand the tensions and contradictions within activity Bound (2007) suggests it helpful to return to the concepts of production, consumption, distribution and exchange (Marx, 1973). Activity, such as a team of teachers engaged in meeting the learning needs of apprentices, is a process of production. Teachers' labour power is used or consumed through the tools they use such as ways of thinking about learning and teaching, videos, workbooks, ICT tools, the web and so on. These tools and materials are made accessible, or distributed according to individual knowledge, skill and aptitude and to the division of labour and distribution of power and authority. The need trade teachers are meeting is the learning needs of their apprentices and the industry.

Figure 1: Social relations of production

As shown in Figure 1, social relations within the activity are mediated by the ways in which tools are consumed (used) and distributed (accessibility), and the object of the activity. As teachers work towards their object they develop objects of production (Bound, 2007). The object of activity is the object or motive which is the 'impelling cause for production which is its presupposition' (Marx, 1973, p.91). The object of production is that which is produced by production and is also the object of consumption both within and outside the activity of production (ibid). A useful differentiation then between the object or motive which is the "impelling cause for

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production" and the object produced, is to refer to that which is being produced for consumption as the *object of production*, and that which is the presupposition for production, *object of activity*.

Although to analyse activity in terms of production, consumption, distribution and exchange may appear to be a functional, limited approach, it in fact opens possibilities for analysing not only structural issues that may need to be attended to, but also the interactions between subjects that contribute to cultural ways of being.

3. METHODOLOGY

A staged iterative approach was used in the case study in which seventeen joinery and carpentry teachers from across the State were involved. These teachers are part of a larger State-wide team located at three regional sites in a public Registered Training Organisation. All volunteered to participate in the project. Most of these teachers teach on campus, a number undertake on-site assessment and three are team leaders. In one regional site, all teachers undertake both on-site assessment and on campus teaching. Team leaders and one of the institution's learning managers were interviewed, and contributed to the implementation of the project. Managers were asked not only about their teaching, but also about institutional processes, structures and their perception of the vision of the institution and how this operated within the team. Initial observations of teaching practice informed the design of the teaching profile instrument.

Central to the methodology was a teacher profiling instrument, used at the beginning of the process, in 2006. This instrument involved collecting survey data and interviewing all teachers and managers involved. The interview covered a range of topics which included asking the participants to describe a typical teaching session and to provide a rationale for their approaches. In order to identify teachers' pedagogical beliefs and the focus on the learner, teachers were also asked to describe how they have used ICT in their teaching and how they think this benefits the learning situation, including a discussion of their apprentices' abilities and progress. Following the interview, teachers were given the section of the profile requiring responses to Likert type statements, yes/no responses and a small number of short answer questions to complete in their own time.

The design of the profiling instrument was based on the work of Watson (2001) and Fitzallen and Brown (2006). Fitzallen and Brown (2006) identify the elements that influence the adoption and successful integration of ICT into teachers' professional practice as: content and curriculum knowledge, ICT content knowledge and application of ICT, knowledge of learners, knowledge of education ends, purposes and values, teacher background, professional development and reflective practice. These elements reflect Schulman's (1987) seven teacher knowledges. To these Fitzallen and Brown added confidence, previous success and enjoyment, being part of a community of learners, and external factors such as time and access to resources.

With some adaptation, most of these elements were used in the profiling instrument for this study. As with the Fitzallen and Brown instrument the types of teacher knowledge used in our profiler included general pedagogical knowledge, application of ICT, knowledge of learners, content and curriculum knowledge, teacher

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background, professional development, confidence and time and access to resources. Content and curriculum knowledge was enhanced in this study to include understanding of flexible learning, as this is the context in which the trade teachers taking part in the study are working.

An intervention strategy in the form of collaborative design workshops was developed using data from the profiles. The main goal of the workshops was to guide the group in their development of a set of ICT learning resources to support their teaching program. These workshops were conducted at the regional level with one or two teachers travelling to other regions for specific workshops. In the first of the workshops the group selected a desktop web authoring environment called eXe (elearning XHTML editor) on which they built an initial resource about using roof trusses. The researchers (the authors) observed this resource being used by apprentices. Two teachers and five of these apprentices were interviewed as soon as they had completed their interaction with the roof trusses resource. An evaluation session with teachers followed where the researchers fed back to the group a summary of the apprentices' comments. The critique of what was a content driven resource resulted in new approaches being identified when developing future resources. An exemplar resource was developed by an expert outside of the team. Another workshop focused on examining this exemplar which has been used enthusiastically by teachers. This process was repeated the following year.

The two researchers and a member of the Registered Training Organisation's flexible delivery management team have worked together to shape and conduct the workshops, with one of the teachers progressively taking a greater role in the planning and delivery of workshops. The final stage will involve trialling of resources currently being developed, following similar processes to those outlined above. Finally teachers will be profiled to recognise progress, provide an opportunity for reflection for the researchers and teachers and to identify ongoing professional development.

4. ACCESS TO PROFESSIONAL DEVELOPMENT

Professional development to enable this group of teachers to implement flexible delivery appeared to be a matter of participating in what was offered, if teachers were not teaching at the time. Table 1 lists the professional development teachers reported they had participated in, in the last five years.

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Table 1: Teacher professional development

Type of professional development	Number of respondents who attended	Length of session
TAA Certificate IV	1	Not known
Learnscope	3	2 days
Learning Design Showcase Day	1	1 day
Networking 2004	1	Not known
E-Learning community of practice	1	3 days and ongoing
Programs for E-Learning	1	2 days
Eluminate	1	Not known
Video editing	3 2	2 days 1 day
WebCT	3 2	1 day 3 hours
PPT	1	Not known
Toolboxes	1	2 hours
None	3	-

Teachers elect to participate or not. For teachers who wish to attend, but who had teaching commitments there appeared to be limited or no access to relief, resulting in these teachers missing professional development opportunities. It should be noted that forms of professional development, not identified as such by teachers, included a number of days through out a year when the State wide team would come together to address issues and make decisions. Opportunities for exchange between the object of production of developing ICT resources, the tools teachers had (e.g. pedagogical tools, video making and editing tools) and access to tools such as video cameras, and ICT skills were not structured.

5. TENSIONS IN THE SOCIAL RELATIONS OF PRODUCTION OF THE TEACHING TEAM

These were a number of tensions evident in the exchange between the distribution of and access to tools teachers consumed or used and tensions in the exchange between distribution and consumption. That is, the distribution and consumption of tools for this group of trade teachers led to limitations in supporting the object of production, namely the development of resources to facilitate flexible delivery. Figure 2 shows some of the major tools this group of teachers consumed and the object of production. Access to (or the distribution of) these tools was limited, resulting in a tension between the object of production and the tools. As discussed below, tools such as different pedagogies assume roles or division of labour; the distribution of roles adds to the tensions.

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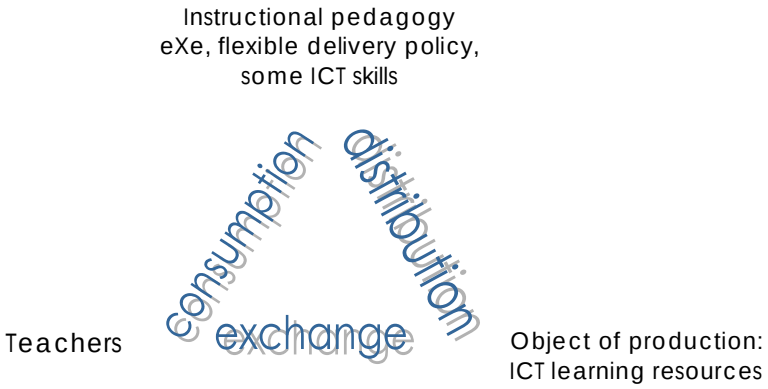
Figure 2: Social relations of production in the teaching team



These tensions are expressed in a number of ways. One is the ways in which teachers consumed or used the pedagogies available to them, and their roles as teachers. Another is the design of ICT resources and the pedagogy of flexible delivery as defined by these teachers.

5.1 Roles, pedagogies, ICT resources and flexible delivery

The pedagogical practice of a teacher places them and their learners in particular roles. An instructional pedagogy places learners as passive and teacher as the expert; teacher as all powerful and learner with little or no power. It is teacher centred. A constructivist, socio-cultural pedagogy where teachers encourage learners to make sense of their world, collaborate with others and use the settings and contexts their learners live and work in, place teachers as facilitators of learning and learners as active participants. It is learner centred. The role of teacher as facilitator, as opposed to instructor, requires teachers to assist students to draw from their own experiences and prior knowledge and integrate new knowledge with existing knowledge (Land & Greene, 2000), as well as to assist learners in analysing and drawing conclusions, designing, experimenting, making predictions. This role assists students to ask questions (Laffey, Tupper, Musser, & Wedman, 1998). In reality, well trained, effective teachers are constantly moving along a continuum of instructor - facilitator.

The extent to which the teachers in this case study were able to move along this continuum and their consumption of different pedagogical practices were limited by their ability to access different practices. The reasons for this are explored further, later in the paper.

Teachers were keen to learn new strategies, and readily engaged in the appropriate rhetoric. This was evident in the first collaborative design workshop where teachers renamed flexible delivery as flexible learning which they defined as:

- Being self-paced
- Being outcome rather than time focused
- Developing learning-to-learn skills in apprentices
- Teaching becoming a process of facilitation
- Providing support for learning
- Requiring a variety of resources

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- Requiring a variety of learning methods
- Assessing on demand (i.e. when apprentices are ready, rather than at preset times)
- Recognizing that learning occurs at the work-site as well as at the RTO

Not only does this list indicate that learning occurs in a variety of places at any time, but it also indicates much about the roles of teachers. This definition of flexible learning indicates teachers would be facilitators of learning, providers of resources, and developers of apprentices learning to learn (metacognitive) skills. These roles differ from the roles teachers had undertaken historically. There was dissonance or tension between the espoused role and current practice. Teachers historically focussed on content, provided resources such as workbooks, developed worksheets, used videos and PowerPoint presentations to assist with content delivery. The ways in which these resources were used is indicative of the role of teacher and of learner (apprentice).

These historical practices were reported at the beginning of the project. Teachers employed strategies such as when using a video they would often introduce the title of the video and ask apprentices to watch. The use of videos in this way is consistent with the notion of the teacher as instructor and the apprentices as passive learners. Apprentices were given little reason to focus their attention and there were no explicit expectations of them on completion of the viewing.

Teachers also reported typically asking lots of knowledge and comprehension questions, mostly closed-ended questions that were only occasionally interspersed with questions requiring higher-order thinking skills. Lower-order knowledge questions such as, “How far down do you place the hinge?” or “What is the spacing between wall studs?” support rote learning, again placing the responsibility for learning with the teacher. The apprentices remain passive learners, not required to fully engage with the content material, to think at a higher level or solve problems. Such teaching strategies are indicative of an instructional pedagogy, placing the teacher as expert for much of the time.

In the first collaborative design workshop the tension encountered between an instructional based pedagogy and constructivist pedagogy was evident in a statement made by one participant: “We cannot ask them that [a higher order question] as we have not yet given them the knowledge”. The confusion arises from a belief that the only pathway to a satisfactory solution is by way of specific information delivered from a single source. Others in the team felt less dissonance as within the workshop they began to explore and think differently about learning.

This was evident as the team worked with a range of still photographs of doors and windows, some of which were deliberately incorrectly labelled, some were examples of poor practice, and others were typical types of doors or windows. Teachers were asked to develop questions using these photographs as a resource for apprentices. This was an exercise in developing higher order thinking skills and providing practice for teachers to develop skills in asking higher order questions and recognise the need to contextualise learning. One group looking at a photograph where a door was incorrectly labelled as a fire door designed a question asking, ‘What is wrong with this picture?’ The attempt to ask apprentices to analyse and apply their knowledge of materials required to meet fire safety standards was almost achieved, in an attempt to place responsibility for learning with the learners, not the teachers. Although there

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was laughter about this response, there was a strong sense of support for everyone's attempts to move through the dissonance they were experiencing. A sense of community was evident from within the team.

Table 2 sets out the roles of teachers and apprentices according to two pedagogical approaches. It should be noted that teachers did of course travel along the teacher – learner centred continuum to some extent. Examples of this included the asking of higher order questions such as, "Why? What are the consequences of …? What alternatives are there ….?" and, "How will you…?" Such questions engage the learners, requiring them to take some responsibility. They also acknowledge the ability, experience and knowledge of the apprentices themselves. These higher order questions were more likely to be used on the workshop floor as apprentices undertook construction work, rather then in the classroom setting.

Table 2. Roles of teacher and apprentices

Role of teacher	Role of learner (apprentice)
Roles using an instructional pedagogy	
To motivate students	To be told
To provide resources	To follow directions
To be the expert	
To front-end load apprentices with underpinning knowledge	
Roles using a constructivist learning pedagogy	
Identify what learners already know	Have responsibility for self-motivation
Facilitate learning	Develop learning to learn skills
Identify scaffolding learners' need	Predict
Develop scaffolding	
Provide/deliver/ facilitate as appropriate	
Provide and manage resources	Active problem solvers
Coach, provide feedback and encourage	Actively draw on their knowledge and experience
Model skills, behaviours, strategies, techniques, processes	
Challenge the learner	Evaluate their own and others' work

Handing over responsibility to students requires a re-thinking of the way tasks and power are distributed between teachers and apprentices. In instruction-based pedagogy, teachers control the pace of learning, including the introduction of new material, and require learners to follow directions and demonstrate expertise. Learners have a passive role. In a constructivist learning pedagogy, learners are active; their experiences are part of a deliberate intention on the part of the teacher, to develop learners' skills in taking increasing responsibility for their own learning.

Some months after the first workshop, one teacher was allocated time to develop an ICT resource using the program eXe, which is an ICT platform which supports the use videos, text, photographs, questioning, and other activities. This platform was chosen

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by the teaching group, in the first workshop, as they decided the simple, easy to use and easy to navigate platform suited their purposes. The first ICT resource produced centred on the content of roof trusses and employed a strong instructional pedagogy. Although the resource was easy to navigate, and included photographs and video clips, it was entirely content based; there were no opportunities to engage with the content. It was not surprising that the 'old' tool of only using an instructional pedagogy was still evident. Change does not occur from one simple intervention; change requires a systemic approach. In an evaluation session of the first resource the researchers reflected back to teachers' feedback from apprentices on their experience of the resource. Some of these comments are given below; apprentices had many suggestions for improvement. Notable is the comment about there being no difference between a workbook and the ICT resource, except that in an environment where a workbook is used teachers are available to make explanations.

> *It's important to understand what I'm doing – why you're doing it, understand how to apply it to a roof …So maybe you could, some kind of program that just showed you the set-out of the house and you had to draw in where the rafters would go, where they would be sitting and what would be holding them, what beams you'd need, joists and everything.*
>
> *A lot of the time you didn't know what [the name of the truss] was, but to get the right wording. Or you know what the bits are, but not how to describe it. I wasn't real sure.*
>
> *Guys doing the teaching in the videos … leave out bits I would have liked to know about [e.g.] there's tricks to putting up a string line, putting in the bracing …*
>
> *"I'd like to understand what the processes are … knowing the stages of how things go together.*
>
> When asked about the difference between the ICT resource and a workbook: *Well nothing really, I suppose [the teacher] explains things on the board to you, draws it out how it actually is and stuff like that.* (Apprentices, 2006).

Teachers' response to hearing the voice of their apprentices led in a number of instances to 'ah-ah' moments, where they recognised that a different approach was required. There was however, uncertainty about what this different approach might be. One of the institution's learning managers from outside the team developed an example of an interactive ICT resource using the same topic of roof trusses and the same eXe platform. When teachers saw this resource they were enthusiastic, as it included a range of interactive games and some problem posing. The resource itself however does not automatically change teacher, learner roles, or lead to a deep understanding of why interaction and problem posing are effective learning strategies.

The discussion above illustrates the need to develop a planned, considered approach to professional development to enable the team to produce ICT resources for flexible delivery. However, to develop a planned, considered approach requires not only an appreciation of the tensions as outlined above, it also requires an understanding of why these tensions are part of the social relations of the team. Exploring the ways in which contextual conditions are embedded in the social relations of the team enables these complex relations to be unpacked.

6. CONTEXTUAL CONDITIONS EMBEDDED IN THE SOCIAL RELATIONS OF THE TEACHING TEAM: SUMMARY OF FINDINGS

Four contextual conditions were identified as being relevant to this study: mode of production, historical pedagogical practices, policy and discourses. These contextual

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conditions are embedded in the tools consumed by this group of trade teachers and in the level of access to and distribution of tools, as well as in exchange between consumption and distribution. The embeddedness of these contextual conditions go some way to explaining why these tensions were evident, and the reliance on the tool of instructional pedagogies, as identified in the previous section.

The reliance on the tool of instructional pedagogies is a reflection of; the mode of production in the industry and within the institution, policy (or lack of it) in relation to teaching qualifications, Training Packages and Criterion Based Assessment, and historical discourses.

Trade teachers are drawn from industry, and in this case study are carpenters and joiners with many years of experience in the industry. Dominant industry employment practices and modes of exchange (that is, the mode of production) in the building industry is based on contractual arrangements. The Australia wide skills shortage in the building industry not only means that trade teachers are difficult to find, leading at times to shortages of teachers, but also mean that the institution is taking on higher numbers of apprentices to train. Both these factors add to teacher workloads. High workloads provide little time for reflection on practice and/or developing new tools. It was not surprising therefore that every teacher interviewed reported that time to develop resources was an issue. Many also expressed some frustration at learning new skills such as making and editing videos in professional development sessions but having no time to use and practice these skills.

Policy relating to teaching qualifications in the State in which the case study was undertaken requires trade teachers to gain a Training and Assessment (TAA) Certificate IV. Teachers in institutions such as this which is a Registered Training organisation are not required to have a teaching degree. Much of the TAA Certificate IV qualification is about compliance issues to meet the requirements of the Australian Quality Training Framework. As a result teachers' pedagogical knowledge is often developed on-the-job, as a tradesperson when working with their apprentices and through professional development offered by the educational institution.

Trade teachers in this institution therefore have limited access to a range of pedagogies, and tools for reflective practice. The reliance on an instructional pedagogy is reinforced by historical practices and discourses embedded in the major tools teachers' use, namely Training Packages which articulate competency based training.

In the 1990s competency based training was embodied in Training Packages which list competencies to be assessed. This resulted in a move away from what trade teachers called curriculum, where materials and resources were developed for them, to having to design their own curriculum. Working within the pedagogical frameworks which are required to meet stringent auditing trails appears to have resulted in what these teachers call 'underpinning knowledge' (theory) needing to be assessed formally. Assessment of apprentices appears to be often designed through the use of low order multiple choice questions.

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Since the introduction of training packages in Australian VET settings, what is described by practitioners as 'underpinning knowledge' has frequently been taught through the use of workbooks. These text based workbooks require students to read the information provided and answer questions. One respondent in our case study pointed out that a study he had undertaken within the institution identified that all questions in the workbooks in one set of trades were lower order questions asking students to recall information. Students were not required to analyse, to synthesize, to create and design, problem identify and problem solve. The result is that much of the teaching and learning is content driven, that is, it is assumed that learners require knowledge to be given to them before they can begin to think at higher levels. Given that the work of trades' people requires considerable problem identification and problem solving and working collaboratively with others, this is problematic.

The introduction of ICT resources is another example of implementation of policy. The introduction of ICT resources is often considered to be the solution to the demand for flexible delivery. For example, the Australian Flexible Learning Framework for the National Vocational Education and Training system notes that:

> The overarching policy task for all VET stakeholders is … to encourage the use of the internet and information technologies … to meet the needs of learners. … [T]here is an even more important driver – the needs of individual and industry clients for more flexible learning options (ANTA, 2001, p. 6).

Flexible delivery endorses "a change to the mindset of teachers and learners" (ANTA, 1998, p. 4) where the teacher "is no longer central to the passing on of information but to the resourcing of the learners, who will then research and absorb the information" (ibid.). Clearly this is a different role for teachers from the one they are currently in. However embedded within this policy statement is the problematic of resourcing the learners. Resources can be designed for passive consumption by learners or require learners to be active participants. This policy statement does not aid teachers and their managers in the implementation of developing learners with good learning to learn skills and problem identifying and solving skills.

The introduction of technology has met with mixed response within the team. Some have embraced it and perceived it as an opportunity. Teachers in the case study reported that a significant number of the total team are fearful of ICT. As tradesmen working in the industry, many had not used computers, and have limited ICT knowledge or skill. Teachers working with the researchers were self selected, even so their confidence with using ICT varied from poor to only two respondents rating some aspects as excellent. A number of the team had attended training in making and editing videos and had partially completed a video (see Table 1). At the beginning of the project teachers' response to the opportunity to work with the researchers was that 'we need to make videos for everything'. This response was driven by the recognition of the importance of providing good quality visual material as learning resources. Learning design factors around the use of these videos had not at that stage been considered. However the intent was that videos would be able to be accessed by apprentices on-the-job or at home as part of the flexible delivery options.

7. CONCLUSION

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As noted by the Australian Flexible Learning Framework, flexible learning is a change process (ANTA, 2001). Changing teaching practices requires more than introducing teachers to ICT resources and developing their skills. Dennen (2005) for example, notes that "tool design may have some effect on pedagogy, but it is the design of specific course activities that affects their ability to generate effective peer and instructor-student interactions." (p. 129). Implicit in the policy of flexible delivery and the use of ICT resources is a discourse that assumes that ICT resources will naturally result in a change in teaching practices. The claim that ICT resources *may* have *some* effect on pedagogy applies because ICT resources create possibilities. However, these possibilities need to be perceived and understood by teachers to be used. The first ICT resource developed within the team was based entirely on delivering content. The resource developed outside the team engaged learners in a number of activities, requiring them to work with the content, rather than passively reading content.

Van de Walle (2004) reminds us that learners need multiple ways to think about emerging ideas and knowledge and weave it into a "web of ideas and relational understanding" (p. 30). Therefore multiple approaches are required to provide practice and opportunity to embed newly forming understandings, whether this is accomplished through pictures or real world situations, using oral language, or drawing, for example. The teachers in this case study face many challenges, not least of which is the challenge of accessing professional development that consistently supports production of ICT resources as part of the implementation of flexible delivery. Without resources and a planned and consistent approach a small interventionist case study cannot address these needs. What the case study has highlighted is the tensions and challenges these teachers face.

Historical precedents have set up tools in the form of patterns of behaviour and thinking that conflict with current organisational and national policy directions. These different conflicting perspectives and tensions between histories, tools, roles and rules are typical organisational change issues. To move along the intended trajectory, these systemic tensions need to be made 'visible' (Engeström, 1999) to all involved with the object of production, that is, all levels of management, teachers and support staff. To understand the mediation of contextual conditions in social relations is to identify problems and issues, and to also create the mediational means for addressing tensions. Identifying tensions, and understanding why they are occurring by analysing the embeddedness of contextual conditions, provides a focus for dialogue, of knowledge construction, of argumentation, and story-telling to make meaning, facilitating shared understanding. Without understanding the mediation of contextual conditions in social relations, a change process is in danger of being piecemeal and adhoc.

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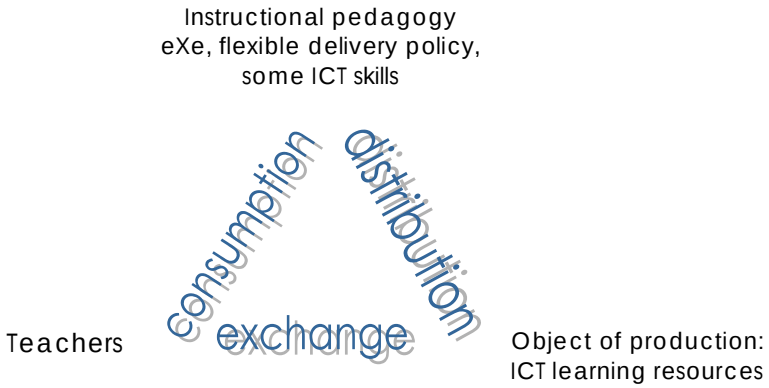
Figure 1: Social relations of production

Figure 2: Social relations of production in the teaching team



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