Technical and Further Education Reforms: Theoretical Issues

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Abstract

This paper examines theoretical issues arising from technical and further education and training reforms over the last few decades. It illustrates how these reforms have been dominated by particular knowledge concerns assumed to be central to specific areas of human activity. It then examines the reforms in terms of theoretical relationships among knowledge, skills, activity and meaning, as advanced by Piaget (1980a, 1980b) and Vygotsky (1934/1986); and discusses the implications for this and other sectors of education. The paper concludes that the reforms in technical and further education have pursued an image of relevance, but have mistaken how individuals construct meaning in workplace activities and the relationships among these kinds of meanings and those used in wider individual and social activities. It is also concluded that this mistake has serious implications for the current directions of the sector and its effectiveness in preparing people for their working lives.

Introduction

There has been continual governmental orchestration of changes in technical and further education and training since the 1960s. Unfortunately, these governmental changes have restricted what is seen to constitute legitimate learning in this sector, and narrowed the focus on what is taken to be knowledge. Moreover, contemporary changes in the identity and image of the sector are consolidating the move away from important kinds of knowing. In this paper, these changes are summarised in the context of wider changes in education more generally, the context of a societal polarisation of what is taken to be legitimate knowledge, and challenges to the idea of cognitive transfer. Then, original Piagetian and Vygotskyan theoretical concepts of knowledge, sense, meaning, thinking and activity are outlined as a basis for examining these reforms at a fundamental knowledge acquisition level.

This analysis is undertaken against the background of a growing literature on the nature of vocational knowledge and its acquisition and transfer. For instance, there is now ample evidence (e.g. Stevenson 2002, 2003a, 2006, 2007) that vocational knowledge:

- arises socially and consists of a contextualised normative capacity-to-do;
- constructs and draws upon a meaningfulness that connects such doing with other kinds of individually constructed shared meanings;
- connects problems encountered in workplaces with other individual and societal pursuits; and
- transforms itself in response to engagement and experience.

(Stevenson 2003b, p. 3)

At the same time it has been suggested that knowledge is created not only through academic disciplines but also through teams of people coming together for short periods of time to solve complex industrial problems (Gibbons et al. 1994). Moreover, such advances in understanding the importance of individual constructions of knowledge through contextualised meaningful activity have been demonstrated in many other kinds of life activities, across cultures, inside and outside of the Western economies (e.g. Lave & Wenger 1991). Still further, other Vygotskyan-based research, from countries outside Australia (e.g. Tuomi-Gröhn & Engeström 2003), has added weight to the challenge that transfer is a mentalistic re-application of generalised knowledge; and rather see learning and transfer in vocational education as the crossing of boundaries and re-contextualisation of knowledge in new socio-cultural settings (e.g. Beach 2003). These concerns about the mentalistic metaphor for transfer echo research now stretching back over two decades (e.g. Collins, Brown & Newman 1989, Hatano & Greeno 1999), and even challenge the de-contextualisation of knowledge in general education (Stevenson 2003c, 2005).

Thus, the point of departure for this paper is to examine reforms in technical and further education, not in terms of literature derived from Piaget and Vygotsky, but in terms of the original concepts in these seminal works themselves. Firstly, before this, seminal literature on curriculum development (Tyler 1949) and literature derived from this (e.g. Laird & Stevenson 1993, Skilbeck 1984, Walker 1971) is used to situate the curriculum development problem that reforms in all sectors of education seek to address. This is followed by a summary of the reforms themselves and their analysis in terms of the making of meaning. And, finally, the implications of this theoretical analysis for the reforms and for the identity of the sector are discussed.

Knowledge concerns in education

In all fields of education, choices have to be made about what should be included in the curriculum. These decisions are value-laden, and are usually derived from a range of considerations, including those of the needs of the learner and society more broadly, as well as the coherence of the subject matter (e.g. Tyler 1949, Walker 1971, Skilbeck 1984). Over time, cycles can be discerned in the value given to different kinds of concerns as illustrated in Table 1. For instance, in times of economic crisis, more value is often given to developing learners for the world of work; while in other times, attempts are made to ensure fuller all-round development of the individual in relation to society (e.g. Maslow 1971, Kemmis Cole & Suggett 1983).

Constructions of relevance	Crises	Appropriate Practice
Relevance to the Individual Fullest intellectual and social meaning of work (Dewey 1916) (Dewey also focussed on wider social concerns)		Develop more than specific skills; use personally and socially significant experiences to develop meaning
Relevance to Efficiency Scientific efficiency (Bobbitt 1924, Charters 1924)	***Post-war reconstruction; Great Depression***	Develop routinised automated manual dexterity, related to industrial needs
Relevance to Society (Tyler 1949)		Aim for plural outcomes drawn from all aspects of social life
Relevance to Outcomes Behaviourism (Mager 1962, Skinner 1954)	***Depression***	Develop observable, measurable performance on predicted tasks
Relevance to the Individual Humanism (Maslow 1971, Rogers 1969) Adult learning (Knowles 1980), UNESCO Report on Learning to Be (Faure et al. 1972)		Help individuals to develop in ways that are important to them
Relevance to Work OECD Report on Competencies Needed in Working Life (OECD 1980)	***Depression, 1983***	Develop functional competence for work
Relevance to Society Critical Theory in Education (eg Brookfield 1988, Grundy 1987, Kemmis, Cole & Suggett 1983)		Empower through learning, so that 'right' action can be determined and pursued
Relevance to Industry Industry driven education (National Training Board 1990, Mayer 1992)	***High levels of youth unemployment; economic and political crisis***	Teach for observable, measurable performance to industrial standards

Table 1: Cycles in Educational Emphases (Modified from Stevenson 1996, p. 37)

Central problems, then, for all sectors of education in determining their image and identity are to work out:

- What should count as knowledge?
- How this should relate to those areas of human activity that are acknowledged as relevant to the concerns of the sector, and those which are thought to be the province of other sectors or life more generally?
- The relative merits afforded to practical and theoretical knowledge.

In technical and further education, the domination of particular concerns is heavily felt, because of the presumed relationship between the productive needs of society and the knowledge needed in addressing these concerns. Often a direct relationship is assumed between industrial needs and knowledge, and it is further assumed that this relationship can be codified into competencies for direct teaching. When this happens, other apparently pertinent concerns (e.g. Laird & Stevenson 1993) can be displaced from curricula.

The continual domination of a singular concern, which often excludes or suppresses other concerns from technical and further education (and which reappears for explicit attention in other sectors of education from time to time), is outlined in the following section. Changes and continuities in the image and identity of technical and further education, over the last 50 years, are summarised in terms of what has counted as vocational knowledge, how it has been seen to relate to human activity and the relative merit afforded to practical and theoretical knowledge. The five illustrative periods selected are the 1960s, the 1970s, the 1980s, the 1990s and the contemporary period. Following this summary, the theoretical implications for the making of meaning are discussed.

Knowledge Concerns in Technical and Further Education in Different Periods

The 1960s

In the 1960s, there were few syllabus documents in the sector (then denoted technical education, comprising highly regarded Technical Colleges in capital and larger provincial cities). Any syllabuses that existed were brief and confined largely to higher level programs (e.g. Diploma). The identity of the sector was associated with the technical content of such courses, especially highly theoretical ones such as the Diplomas in Mechanical and Electrical Engineering that led to professional recognition by prestigious professional institutes. This recognition of the importance of both theoretical and practical capacities extended also to trade and similar courses. The areas of human activity recognised for inclusion in the curriculum were work or industry-based, and included practical and related theoretical content. Continuity was discerned between these and university courses.

However, as a result of the Martin Report (Committee on the Future of Tertiary Education in Australia 1964), the identity of technical education suffered a severe blow, with the move of its higher-level courses to the new Colleges of Advanced Education.

The 1970s

Since the Martin Report, the sector has struggled for a new identity in the face of the consequent loss of status for its remaining courses. That is, the sector has had to demonstrate to industry that courses other than those that were central to its previous identity were also important in their own rights in meeting the needs of industry for skilled workers. For instance, it sought recognition of a 'para-professional' tier in industry and for the relevance of courses to this need, but this quest was largely lost to the more prestigious Associate Diplomas offered by the newer Colleges of Advanced Education. Nevertheless, trade, advanced trade and certificate courses still retained complementary theoretical and practical components; however, they became more isolated from other areas of human activity.

In the mid-1970s, the Kangan Report (Australian Committee on Technical and Further Education 1974, p. 14) urged the new sector of technical and further education (TAFE) to shift its primary emphasis from anticipating and meeting the vocational needs of the community to meeting the needs of the 'individual person who wishes, within the limits of his [*sic*] capacity, to develop his abilities to the best advantage of himself and the community including industry and commerce'. The Committee advanced two aspects of relevance as a basis for curriculum design in TAFE – relevance to vocations and relevance to individual needs, with the former a consequence of the latter. The committee argued that there was a false dichotomy between general and vocational education. Thus, there was a connectedness promoted between different areas of human activity, and between the theoretical and the practical. 'Life skills' were introduced into technical courses, and the needs of young people in relation to society were given attention in curriculum development (TAFE Council of the Tertiary Education Commission 1979).

Nevertheless, an emphasis on occupational analysis had emerged as a central basis for curriculum design and syllabus documentation in the late 1970s and early 1980s. Broderick and Kuhl (1981, p. 810) concluded that 'in most TAFE authorities course objectives and subject terminal objectives are derived from expected behavioural achievements'. Thus, the emphasis had moved back to the technical and the practical, the dominant area of acknowledged human activity became work, and wider individual and social concerns intruded only when seen as economically important. Thus, the end of the 1970s already threatened the connectedness among different ways of making meaning, advocated by Kangan.

The 1980s

While it was argued in the 1970s that vocational needs were secondary to meeting individual personal needs, the tension between these needs persisted (e.g. McBeath 1986, Stevenson 1985, 1989, 1993). The quest for a direct match between known occupational skills and course content gathered momentum in governmental reports, influenced directly by valuing immediate political, social and economic concerns, bringing with them a shorter time horizon for educational goals. The calls were to respond to the labour market (e.g. Kirby 1985), internationalisation (Dawkins & Holding 1987, National Board of Employment, Education and Training 1989, 1990, Minister for Employment, Education and Training 1989), and changing technology (e.g. Committee of Enquiry into Technological Change in Australia 1980).

Other concerns emerged, for example concerns about equity and levels of participation of particular groups in education (Department of Education and Youth Affairs 1983, Commonwealth Tertiary Education Commission 1984, Minister for Employment, Education and Training 1989) and about pathways from schools to TAFE to higher education (Minister for Employment, Education and Training 1989); but these did little to interrupt the highly focused thrust towards the competency-based training imperatives of the 1990s. There was a watershed in 1987, committing the newly formed vocational education and training (VET) sector to a singular emphasis on occupational outcomes. Unlike its predecessors, the Department of Employment, Education and Training (1988) focused almost exclusively on the instrumental role of TAFE and the other parts of the new VET (Vocational Education and Training) sector. It stated that one of its five objectives for TAFE in 1989 was improvements in relevance, albeit with the caveat that the implementation include the relating of relevance to contemporary economic development as well as social justice, literacy and improved participation of Aboriginals and women with children. In 1989, the Minister for Employment, Education and Training (1989, p.6) limited improving relevance to 'potential skill shortages, areas of significance to the economic development of the State, the pace of award restructuring, in particular industries and equity objectives'.

Thus, the primary concern for industrial activity and for industry-derived practical technical knowledge was consolidated; wider individual and social concerns were excluded or constructed in terms of the learners' deficits (needs for more practical technical knowledge); and it was assumed that it would be unproblematic to add-on to technical further education as students moved into other educational pathways.

The 1990s

The contemporary VET sector, initiated in the late 1980s and the 1990s, introduced industry-based competency-based training, with a converging view on what constitutes

competence. This sector included but displaced the technical and further education sector. It re-constructed TAFE entirely in terms of industrial needs. In the early discussion paper (The National Training Board 1990), competency-based training was exclusively behavioural, directed at pre-specified performances, expressed as verbal descriptions of expected behaviours. Criticism of the narrowness and specificity of such capacities was followed by policy-makers (National Training Board 1992, p. 29) then differentiating categories of competence into 'tasks', 'management of groups of tasks', 'contingency management' and 'job/role environment' skills, stating that such behaviour required 'underlying knowledge'. Many researchers advanced the case for conceptualising competent performance as flowing from underlying 'attributes' (e.g. Hager & Gonczi 1993) or cognitive dispositions and structures (e.g. Stevenson 1985, 1993, 1996, 2003b). Nevertheless, the content of modules remains restricted to industrially endorsed skills, called standards, with their detailed units and elements of competence, performance criteria and other confining parameters. The sector also accepted the Key Competencies (Mayer 1992), perceived as 'generic' or 'transferable' capacities across different kinds of work, and denoted as problem-solving; collecting, analysing and organising information; using technology; using mathematical ideas and techniques; working with others and in teams; planning and organising activities; and communicating ideas and information. These ideas of vocational competence are now contained in what are called 'Training Packages'.

Thus, the knowledge seen as legitimate was explicitly confined to that needed by industry, with work the only kind of human activity recognised. The value of theoretical knowledge was secondary to that of practical knowledge through which it got its legitimation as underpinning performance. Wider social concerns were left out entirely. Over time, successive governments had orchestrated shifts not just in concern, but in the primary foci of courses for vocational education to more immediate utilitarian ends: contemporary industrial objectives. This view of the primary concern of vocational education displaced Kangan's philosophy relating to access to lifelong education, educational service and unity in diversity, and relevance to a learning society (e.g. Byrne & Kirby 1989). Arguments for a more substantive base on which to reconcile different kinds of vocational educational concerns (e.g. Hyland 1994, Stevenson 1989) were ignored.

Contemporary VET

Reforms in technical further education have been consolidated and extended in the last decade (e.g. Australian National Training Authority 2003, Australian National Training Authority 2004a, 2004b, Department of Education, Science and Training 2005). Most of these reports take the virtues of competency-based training for granted and proceed to describe training systems overall and give macro-statistics for the uptake of competency-based training modules (e.g. Australian National Training

Authority 2003). However, some not only highlight some of the main aims of the reforms but also refer to such persistent challenges as the incorporation of 'generic' and 'employability' skills, and the participation of equity groups and the limitations of 'Training Packages'.

For instance, in the *Moving On* report (Australian National Training Authority 2004b, p. 28), some voice is given to the fact that 'Training Packages' are not curriculum, but are persistently interpreted by teachers and trainers as being such; and that there is need for 'higher-order professional expertise' to draw from a 'wider pedagogical repertoire' in developing competence. Surprisingly, the authors are puzzled at how this situation would result from the last 20 years of government competency-based education policy. That is, we see the beginnings of a move back to recognising the importance of curriculum and pedagogy, after more than two decades of displacing these considerations with 'competency standards'. This same report sees 'generic skills' as the 'most significant design issue facing the Training Package model' (p.19); again a surprising discovery almost 15years after the Mayer report. Some of these re-discovered themes also receive mention in the *Skilling Australia* report (Department of Education, Science and Training 2005, p. vi), especially with the call for 'more flexible Training Package qualifications – explicitly incorporating employability skills. Yet the persistence of imposing competency-based training continues: 'more must be done to embed the competency approach in vocational education and training. For example, many New Apprenticeships still apply a time-based approach to training' (p. 19).

Thus competency-based training persists with its assumption that what constitutes effective performance in workplace activities can be codified, modularised and transmitted to learners, despite the finding of a wide-ranging European study, a decade ago, that much of what is valuable in effective workplace activity is tacit, social and difficult to communicate (e.g. Lundvall & Borrás 1997). Certainly, there is now more explicit recognition that competence involves understanding, and that the development of this understanding does not flow directly from industrially-specified competences. That is, there has been a return to semi-official statements that seem to recognise long lost curricular concerns that, rather, curriculum development, together with pedagogical expertise is needed to engage learners in activities that will develop workplace knowledge.

There is also a consolidation of growing levels of articulation and credit transfer between VET courses and bachelor level programs in universities, involving credit of a year or more. As well, there is the prospect of Associate and Bachelor level degrees in the VET sector, echoing the Associate Diplomas that were so successful in the Colleges of Advanced Education in the 1970s and 1980s and the Diplomas that were the hallmark of Technical Colleges in the 1960s. These moves away from trade-level

instruction include the movement of Certificates Level 3 (e.g. trade courses) into specialised facilities, 'freeing TAFE up' to concentrate on its higher level courses, leaving open its future relationship with higher education.

Summary

As in other sectors of education, there have been many possible candidates for recognition as legitimate vocational knowledge over the last four decades. However, the most frequently identified knowledge concern for vocational education has been practical technical skills as identified by industry as important to its immediate future. This kind of legitimacy has usually been afforded because of recognition of the need to prepare learners for the skilful activities expected in workplace settings, and, in recent decades, these often have been seen in such simplistic terms as routinised behaviours. Other possible concerns have also sometimes been acknowledged (e.g. conceptual or theoretical understandings of technical matters). For instance the *Moving On* report makes explicit that competence requires 'personally held skills, knowledge and abilities, which, in combination, underpin performance' (p. 16). However, such a focus has not been prevalent in actual learning experiences (Stevenson & McKavanagh, 1994) in past operationalisations of competency based training; and it remains to be seen if a renewed movement towards acknowledgement of curriculum and pedagogy will redress this in the future. Moreover, while skills of a personal or social nature that are drawn upon in pursuing workplace activities, are sometimes acknowledged, they again are seldom found in contemporary technical and further education teaching and learning practice. Social concerns that are wider still have been afforded little legitimacy in recent reports or practice, for example, knowledge of theoretical disciplines (like science, engineering and business studies), and knowledge related to wider personal and social concerns such as the environment and justice. That is, there has grown, over the last 50 years (with the possible exception of the Kangan and Mayer reports) a larger disconnection not only with discipline-based theoretical knowledge but also with the arts and humanities, critical thinking and knowledge for engaging in civic, social, family and personal activities outside of work.

Nevertheless, it is acknowledged that an important consideration in working out what should count as vocational knowledge is, indeed, an understanding of workplace activities, how workers make sense of them and how they engage in them successfully. However, the parallel consideration is whether this sense making and engagement are separable from making sense of other activities, engaging in them and reflecting on them; especially activities where declarative propositional knowledge (often theoretical), represented in language or other symbolic forms, is used. In the following section, the 'reforms' in technical and further education, especially over the last forty years, and their assumptions about what should count as

vocational knowledge, are explored in terms of the original Piagetian and Vygotskyan theoretical concepts of sense and meaning, their development and their relationships to understanding, using language, and thinking.

Making sense and meaning in activity

Everyday concepts and dichotomies

The dominant segregation of vocational and other knowledge over the last forty years is at odds with everyday speech, where words like 'knowledge', 'understanding', 'sense' and 'meaning' are often taken to be synonymous. It is particularly at odds with the rival assumption in much of general education that important 'knowledge' is declarative, can be decontextualised, and can be verbalised as speech; and that any 'understanding' that cannot be verbalised is impoverished and should be afforded lower status – as intuitive, misconceived or unreflective. This dichotomy is reflected in such everyday phrases as 'knowledge and skills' as though the capacity to do things is not meaningful, does not count as knowledge and is not related to other avenues for interpreting experience. Moreover, the *Moving* On report refers to 'knowledge, skills and abilities' (Australian National Training Authority 2004b, p. 6) and unproblematically calls for the adding on of 'generic skills'. Such dichotomies have been identified by Tight (1996, p. 67) as Education vs. Training, Knowledge vs. Skill, Understanding vs. Experience and Academic vs. Vocational; and these polarisations have become so entrenched that they appear to have been institutionalised differently on each side of the divide as illustrated in Table 2 (Stevenson 1998, p. 3). These dichotomies are explored in terms of the theoretical concepts of sense and meaning below.

Sense and Meaning

Following Piaget (1980a, b), it is assumed here that individuals construct their own understanding.

> Fifty years of experience have taught us that knowledge does not result from a mere recording of observations without a structuring activity on the part of the subject. Nor do any a priori or innate cognitive structures exist in man [sic]; the functioning of intelligence alone is hereditary and creates structures only through an organization of successive actions performed on objects. (Piaget 1980a, p. 23).

According to Piaget (1980a, p. 28), the 'logic of actions' is established before language. He argues that the development of abstractions from experiences leads to a 'reorganization' and that this can occur before any 'general thematization' and without the need for 'conceptual awareness of structures'. Thus, understanding

Some General Education Dichotomies	Some Vocational Education Dichotomies
Thinking (vs. doing) Understanding (vs. doing)	Doing (vs. saying) Performing (vs. theorising)
Conceptual (vs. practical) Theoretical (vs. skilled)	Useful (vs. abstract) Skilled (vs. useless)
General (vs. specific)	Concrete (vs. general)
Learning processes (vs. products)	Outcomes (vs. academic knowledge)
Academic (vs. skills based)	Practical (vs. academic)
Articulated (vs. tacit) knowledge	Competence (vs. ability, excellence, knowledge)
Problem-solving (vs. routine action)	Responding to contingencies and breakdowns in routine (vs. skills)
Education (vs. training)	Training (vs. useless knowledge)
Disciplines (vs. incoherence)	Problem-solving (vs. theorising)
Learning for its own sake (vs. vocational education)	Productivity (vs. theorising)
Preparation for life (vs. work)	Economic growth (vs. living)

Table 2: Dualisms in Different Educational Communities (Stevenson 1998, p. 3)

through doing (e.g. skills or 'schemes of action') and assimilation to those schemes does not have to be mediated by words with given meanings. It is for these reasons that Piaget could refer to 'sensorimotor assimilation' (Piaget 1980a, p. 28) and 'sensorimotor intelligence' (Piaget 1980b, p. 164). Although Piaget was concerned primarily with development, the logic of his position is that the capacity for actions is a kind of understanding, and verbal descriptions of such actions are another way of understanding them (e.g. Ryle 1949). Certainly, Piaget was not devaluing the contribution of his formal operational stage of cognitive development to the sophisticated use of symbolic thought, but he was giving legitimacy to practical knowledge that is often overlooked in everyday and educational discourse. At the same time he was not advocating sensorimotor intelligence as the ultimate in learner development; rather, he was examining ways in which deeper understanding can develop from direct concrete experience.

A related view is that of Vygotsky (1934/1986) who differentiated the idea of *sense* and *meaning*. For Vygotsky, sense is how we idiosyncratically understand our direct experiences and includes skills and practical knowledge, whether verbalisable or not. Sense is not always verbalisable because as Polanyi (1966/1983, p. 23) observes, we

'know more than we can tell'. The role of word meanings is to allow us to take more control over our understanding and thinking, and to make it more connected to collective ways of making meaning and communicating. Vygotsky saw meaning as more constant than sense, with a word taking its meaning from its context. That is, understanding consists in the sense one makes of a situation, and it is possible that this understanding may be verbally communicated, but only through mediation by the collective meaning of words.

Presumably, then, engagement in work activities (the dominant subject of vocational education) requires the making of sense, where this sense is contextualised; and, for skills and other tacit knowledge, this sense may or may not be easy to communicate in words with given word meanings. Moreover, Vygotsky (1934/1986, p 88) argued that not all thinking is undertaken in language:

> Verbal thought, however, does not by any means include all forms of thought or all forms of speech. There is a vast area of thought that has no direct relation to speech. The thinking manifested in the use of tools belongs in this area, as does practical intellect in general.

Thus, the practical knowledge (including skills) celebrated in successive technical and further education reforms represents an area of thought that does not necessarily have a direct relationship to speech or language, that is, to theoretical knowledge. The importance of practical knowledge is echoed in Gibbons et al's (1994) 'Mode 2' knowledge and in Lundvall and Borras' (1997) study of skills needed in changing economies. In the same vein, it is important to emphasise that Vygotsky (1934/1986) did not regard all understanding or thinking as *scientific*, i.e. as undertaken using theoretical, verbalisable concepts. Rather he recognised that *spontaneous* concepts (here called *sense* or *personal meaning*) are a kind of understanding derived from personal experience of contextualised activities; and that a constant interaction between the two kinds of meaning is needed to develop control over our own thinking and action.

> One might say that *the development of the child's spontaneous concepts proceeds upward, and the development of his [sic] scientific concepts downwards*, to a more elementary and concrete level. This is a consequence of the different ways in which the two kinds of concepts emerge. The inception of a spontaneous concept can usually be traced to a face-to-face meeting with a concrete situation, while a scientific concept involves from the first a 'mediated' attitude toward its object … The strength of scientific concepts lies in their conscious and deliberate character. Spontaneous concepts, on the contrary, are strong in what concerns the situational, empirical, and practical. (Vygotsky 1934/1986, pp. 193, 194)

While speaking primarily about development, Vygotsky (1936/1984) was aware that these ideas about different kinds of meaning, some driven by scientific concepts, others more directly related to experience, apply to all learning and development, even for adults; and there often continues a tension between the different kinds of knowing.

> Even after the adolescent has learned to produce concepts, he [sic] does not abandon the more elementary forms; they continue for a long time to operate, indeed to dominate, in many areas of his thinking. As we have mentioned earlier, even adults often resort to complex thinking. Moreover, even conceptual thinking in adolescents and adults, insofar as it is involved in solving daily problems, does not advance beyond the level of pseudoconcepts (Vygotsky 1936/1984, pp. 140-141).

These ideas echo Piaget's (1980a, b) view that learners seek equilibrium through processes of assimilation and accommodation. Vygotsky (1936/1984) advanced the idea of a struggle until an individual acquires some control over the 'scientific concept' and can use it to understand previous experience in a new way. He thought it a mistake to equate thought and language. Rather, words are used to convey the meanings of thoughts. Communication of thoughts has to occur through such devices as words and this is not unproblematic. Indeed, 'precisely because thought does not have its automatic counterpart in words, the transition from thought to words leads through meaning' (Vygotsky 1936/1984, p. 251).

Applying Concepts of Sense and Meaning to Workplace Activity

These concepts can be applied to workplace and other activities as follows. Individuals make new meaning by bringing their existing meanings into interaction with the context (Beach 1999). They construct their new understanding by re-contextualising existing meanings, so that they can then relate them to the particulars of the new context (van Oers 1998). This is not a qualitatively different process in workplace activities; it involves extending one's understanding of experience in terms of all of the experiences already understood. That is, for a new situation to be truly meaningful, it needs to be related to understanding of other activities. The new meanings have to add up. One increases personal control over a new situation if one can understand it in terms of both spontaneous and scientific concepts. This is the nature of real transfer: being able to relate the particulars of concrete situations to the particulars of other concrete situations and to abstractions from those sets of particulars. This is what happens when Gibbons et al's (1994) 'Mode 2' knowledge is constructed. Moreover, the need for rich connections between spontaneous and scientific ways of knowing is reinforced by the finding that professionals develop an embodied kind of encapsulated knowledge after years of experience (Boshuizen, Schmidt, Custers & Van De Wiel 1995).

Conclusions

In workplace activities, then, a fresh analysis is needed of relationships among sense and meaning, between spontaneous and scientific concepts, between practical and theoretical intelligence; and how legitimacy should be afforded to different ways of constructing and communicating understanding. In the following paragraphs, the 'reforms' in technical and further education over the last four decades are considered in terms of how sense and meaning are made in workplace activities, how these relate to meanings developed in other educational settings, and the implications for the future identity and image of the sector.

In all of the reforms outlined above, with the possible exception of the Kangan Report (Australian Committee on Technical and Further Education 1974) and renewed mention in *Moving On* (Australian National Training Authority 2004b), little has been said about individual learners, their centrality in making sense of their learning and constructing new meaning, and how this new meaning is drawn upon in confronting the challenges of workplace activity. Rather, the policies for the sector have been based on a transmission view of performance-based knowledge, assumed to be transferable across changing contexts. Such a view has assumed also that the sense and meaning constructed in working activities can be codified, modularised and transmitted to receptive learners. It has ignored the relationships among knowledge, meaning, sense, performance and activity, the learner's challenge in forging such connections and the need for connectedness across different life activities for new learning to make sense. Concern has been confined to what industry has perceived as necessary in the way of skills, and practical knowledge has been constructed as verbal descriptions of what such behaviour would look like.

Certainly, it is recognised that practical knowledge as spontaneous concepts, unmediated by word meanings, that allow workplace experiences to be understood and actions to be performed, should be valued, because, among other things, they allow skills or competencies to be rendered productively in compliance with industrial standards. Also, it is true that some skilful technical activity can be codified into industrially derived verbal descriptions: for example, it can be stated as a competency. This can provide a medium for some limited communication about such personal understanding. Moreover, workplace activities are activities as described by Leont'ev (1981). That is, they are collective; and individual actions and operations (however spontaneous or tacit) take their meaning from the collective problem being worked on. Hence, the sense made by individuals in their own context, needs to be located within an overall understanding of the contextualised workplace activity as a whole, their own part in that activity and the place of the activity in the overall organisation. Making sense in this way, in terms of collective meaning, requires the capacity to understand how others construct meaning, and communicating this,

usually through word meanings. That is, understanding and contributing to workplace activities requires individual sense making, but it also requires the capacity to make connections between personal sense and public collective, verbally mediated meanings. Nevertheless, it needs to be recognised, as Lundvall and Borrás (1997) observe, that many valuable workplace skills still remain tacit.

Thus, developing learners' capacities to connect practical and verbal ways of making workplace meanings would provide them with more control over their thinking and their actions in workplace and other activities. It is important, though, that connections among workplace activities and verbal codes be used as a basis for connecting these meanings further, with those derived in other communities of practice, i.e. making connections among the technical and the social, the practical and the theoretical, the concrete and the abstract, and so on. Such wider connections with the wider world of meanings would deepen understanding, preparing learners better to face not only routine and problematic workplace situations, but also changes in technology and disruptive social, economic and political changes. It would also serve the articulation and credit transfer goals of the sector well.

Hence, there are significant challenges to the identity and image of technical and further education and its recent reforms. Reforms in technical and further education have made various assumptions about the aspects of various ways of knowing that should be afforded primacy or legitimacy, and these assumptions often have been transacted in a discourse about relevance. It is this idea of relevance, especially relevance to industry, which is used to confer an image and identity on the sector and adduce legitimacy for its confined knowledge concerns. Yet, like all polarisations, this image mistakes the ways in which new meaning is constructed and the connected nature of meaning.

Thus, in the continually reforming sector of technical and further education (now VET), the constant returns to industrially-derived verbal codifications of specific behaviours found in workplace activities, impoverishes learners' potential understanding, thinking, and development, which all draw on more controlled understanding. Certainly, learners may advance to constructing a kind of tacit, spontaneous, workplace-based collective meaning on their individual actions and operations (Leont'ev 1981), and even the industry-based verbal codifications of these performances. However, the relationships with their own existing understanding and wider understandings in other domains may be quite isolated, confining learner control over their understanding and thinking. This is unconnected relevance; and relevance to the present and immediate past, while it is connectedness in thinking that is needed in adapting to different materials, processes and systems in workplaces, in generating innovations and in being productive. In addition, personal control over

such connections is critical in coping with the challenges of social and economic crises. Further, the goal of better articulation of technical and further education courses with higher education depends on the learner being able to re-work their existing understandings in ways that may at present be unreachable.

It would be wise, therefore, for the sector to take a more critical look at its assumptions about its primary concerns, the relationships of these concerns to individual and wider societal concerns, the ways in which meaning is constructed in various forms of human activity, the connectedness of such meanings, and the implications for the knowledge concerns of the sector and its flawed image of relevance. It needs to address the growing isolation of its knowledge and educational concerns from those of other educational and professional communities of practice. It needs to revisit the kinds of human activities from which to derive its curricular content, to re-consider the range of meanings that are involved in routine, problematic and generative work place activity and to develop ways of connecting spontaneous, practical and tacit meanings derived from workplaces with those derived in different communities of practice. As suggested in *Moving On* (Australian National Training Authority 2004b), a renewed focus on curriculum and pedagogy, directed at these goals is very much overdue. In short, the very image of the sector as 'relevant' to the needs of industry requires a commitment to re-connecting workplace and more general meanings, as were commonplace in the 1960s. Moreover, radical change in re-connecting workplace, theoretical and everyday meanings is needed to ensure that competency-based education ceases to lock the working class out of powerful knowledge (Stevenson 1998, 2005, Wheelahan 2007).

References

Australian Committee on Technical and Further Education (1974) *TAFE in Australia:* Report *on Needs in Technical and Further Education*, Australian Government Publishing Service, Canberra.

Australian Committee on Technical and Further Education (1975) *TAFE in Australia: Second Report on Needs in Technical and Further Education*, Australian Government Publishing Service, Canberra.

Australian National Training Authority (2004a) *Annual Report of the Australian Vocational Education and Training System 2003*, Australian National Training Authority, Brisbane.

Australian National Training Authority (2004b) *Moving On… Report of the High Level Review of Training Packages*, Australian National Training Authority, Melbourne.

Beach, K. (1999) Consequential transitions: a socio-cultural expedition beyond transfer in education, in A. Iran-Nejad & P.D. Pearson, eds., *Review of Research in Education*, vol. 24, pp. 101-40.

Beach, K. (2003) Consequential transitions: A developmental view of knowledge propagation through social organisations, in T. Tuomi-Gröhn & Y. Engeström, eds., *Between School and Work: New Perspectives on Transfer and Boundary-Crossing* (pp. 39-62), Pergamon, Amsterdam.

Bobbitt, F. (1924) The new technique of curriculum making, *The Elementary School Journal*, vol. 25, p. 49.

Boshuizen, H.P.A., Schmidt, H.G., Custers, E.J. and Van De Wiel, M.W. (1995) Knowledge development and restructuring in the domain of medicine, the role of theory and practice, *Learning and Instruction*, vol. 5, pp. 269-85.

Broderick, J. and Kuhl, D. (1981) *An Investigation of the Processes of Curriculum Development in TAFE in Australia*, Australian Government Publishing Service, Canberra.

Brookfield, S (1992) On ideology, pillage, language and risk: critical thinking and the tensions of critical practice, *Studies in Continuing Education*, vol. 13, no. 1, pp. 1-14.

Byrne, M. and Kirby, P. (1989) Educational ideas and ideals: is there a TAFE philosophy?, in W. Hall ed., *TAFE in the 1990s*, TAFE National Centre for Research and Development, Adelaide.

Charters, W.W. (1924) Functional analysis as the basis for curriculum construction, *Journal of Educational Research,* vol. 10, pp. 214-221.

Collins, A., Brown, J. and Newman, S. (1989) Cognitive apprenticeship: teaching the crafts of reading, writing, and mathematics, in L. Resnick, ed*., Knowing, Learning and Instruction. Essays in honor of Robert Glaser* (pp. 453-494), Erlbaum Associates, Hillsdale, New Jersey.

Committee on the Future of Tertiary Education in Australia (1964) *Tertiary Education in Australia: Report of the Committee on the Future of Tertiary Education in Australia*, Australian Universities Commission, Melbourne.

Committee of Inquiry into Education and Training (1979) *Education, Training and Employment: Report of the Committee of Inquiry into Education and Training*, vol. 1, Australian Government Publishing Service, Canberra.

Committee of Enquiry into Technological Change in Australia (1980) *Technological Change in Australia: Report of the Committee of Enquiry into Technological Change in Australia*, Australian Government Publishing Service, Canberra.

Commonwealth Tertiary Education Commission (1984) *Participation and Equity Program TAFE Guidelines for 1985*, Australian Government Publishing Service, Canberra.

Commonwealth Tertiary Education Commission (1987) *Report for the 1988-1990 Triennium*, vol. 1, Part 5, Report of the Technical and Further Education Council, Australian Government Publishing Service, Canberra.

Department of Education, Science and Training (2005) *Skilling Australia: New directions for Vocational Education and Training*, Commonwealth of Australia, Canberra.

Department of Employment, Education and Training (1988) *TAFE 1989: Commonwealth programs and priorities*, Australian Government Publishing Service, Canberra.

Dawkins, J.S. and Holding, A.C. (1987) *Skills for Australia*, Australian Government Publishing Service, Canberra, Australia.

Department of Education and Youth Affairs (1983) *Participation and Equity: Funding Guidelines to the Commonwealth Education Commissions for 1984*, Australian Government Publishing Service, Canberra.

Dewey, J. (1916) *Democracy and Education*, Macmillan, New York.

Faure, E., Herrera, F., Kaddoura, A., Lopes, H., Petrovsky, A., Rahnema, M., and Ward, F. (1972) *Learning to Be*, UNESCO, Paris.

Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S, Scott, P. and Trow, M. (1994) *The New Production of Knowledge. The Dynamics of Science and Research in Contemporary Societies*, Sage, London.

Grundy, S. (1987) *Curriculum: Product or praxis? Deakin studies in education series: 1*, Falmer, London.

Hager, P. and Gonczi, A. (1993) Attributes and competence, *Australian and New Zealand Journal of Vocational Education Research*, vol. 1, no. 1, pp. 36-45.

Hatano, G. and Greeno, J.G. (1999) Commentary: alternative perspectives on transfer and transfer studies, *International Journal of Educational Research*, vol. 31, pp. 645-654.

Hyland, T. (1994) *Competence, Education and NVQs: Dissenting Perspectives*, Cassell, London.

Kemmis, S., Cole, P., and Suggett, D. (1983) *Towards the Socially-Critical School*, Victorian Institute of Secondary Education, Melbourne.

Kirby, P., chair (1985) *Report of the Committee of Inquiry into Labour Market Programs*, Australian Government Publishing Service, Canberra.

Knowles, M. (1980) *The Modern Practice of Adult Education: From pedagogy to andragogy* (2nd edn), Cambridge University Press, New York.

Laird, D.J. and Stevenson, J.C. (1993) Curriculum development in vocational education, *Australian and New Zealand Journal of Vocational Education Research*, vol. 1, no. 2, pp. 71-92.

Lave, J. and Wenger, E. (1991) *Situated Learning: Legitimated Peripheral Participation*, Cambridge University Press, Cambridge.

Leont'ev, A.N. (1981) *Problems of the Development of the Mind*, Progress Publishers, Moscow.

Lundvall, B-Å and Borrás, S. (1997), "Innovation Policy in The Globalising Learning Economy", (TSER programme, DG XII, Commission of the European Union), Retrieved: 23 October, 2007.
<http://cordis.europa.eu/tser/src/sumfinal.htm>.

Mager, R.F. (1962) *Preparing Instructional Objectives*, Fearon, Belmont, California.

Maslow, A.H. (1971) *The Further Reaches of Human Nature,* Viking, New York.

Mayer, E., chair (1992) *Putting General Education to Work: The Key Competencies Report*, The Australian Education Council and Ministers for Vocational Education, Employment and Training, Canberra.

McBeath, C. (1986) *Curriculum Decision Making in TAFE*, TAFE National Centre for Research and Development, Adelaide.

Minister for Employment Education and Training (1989) *TAFE 1990: Commonwealth Programs and Priorities,* Australian Government Publishing Service, Canberra.

Minister for Employment, Education and Training, TAFE (1990) *Commonwealth Programs and Priorities*, Australian Government Publishing Service, Canberra.

National Board of Employment, Education and Training (1989) *Industry Training in Australia: The Need for Change*, Interim report by the Employment and Skills Formation Council to the Minister for Employment, Education and Training, Australian Government Publishing Service, Canberra.

National Board of Employment, Education and Training (1990) *The Recognition of Vocational Training and Learning: Commissioned Report No.1*, Employment and Skills Formation Council, Australian Government Publishing Service, Canberra.

Piaget, J. (1980a) The psychogenesis of knowledge and its epistemological significance, in M. Piattelli-Palmarini, ed., *Language and Learning: The Debate between Jean Piaget and Noam Chomsky*, Harvard University Press, Cambridge, Mass.

Piaget, J. (1980b) Schemes of action and language learning, in M.Piattelli-Palmarini, ed., *Language and Learning: The Debate between Jean Piaget and Noam Chomsky*, Harvard University Press, Cambridge, Mass.

Polanyi, M. (1983) [1966] *The Tacit Dimension*, Peter Smith, Gloucester, Mass. (Reprint, originally published by Doubleday.)

Rogers, C. (1969) *Freedom to Learn*, Merrill, Columbus, Ohio.

Skilbeck, M. (1984) *School-Based Curriculum Development*, Harper & Row, London, England.

Skinner, B.F. (1954) The science of learning and the art of teaching, *Harvard Educational Review*, vol. 24, pp. 86-97.

Stevenson, J.C. (1985) Curriculum development in TAFE: General education versus skilled-based education, *Curriculum Perspectives*, 1985, vol. 5, no. 1, pp. 57-61.

Stevenson, J.C. (1989) Curricular issues, in W. Hall, ed., *TAFE in the 1990s*, TAFE National Centre for Research and Development, Adelaide.

Stevenson, J.C. (1993) Policies and practices in vocational education and training in Australia, in W. Hall, ed., *What Future for Technical and Vocational Education and Training?* National Centre for Vocational Education Research, Adelaide.

Stevenson, J.C. (1996) The metamorphosis of the construction of competence, *Studies in Continuing Education*, vol. 18, no. 1, pp. 24-42.

Stevenson, J.C. (1998) Institutionalised polarisations of knowledge. Keynote address at Vocational Knowledge and Institutions: changing relationships, 6th International

Conference on Post-compulsory education and training, Centre for Learning and Work Research. Griffith University, Surfers Paradise, Australia 2-4 December.

Stevenson, J.C. (2002) Concepts of workplace knowledge, *International Journal of Educational Research*, vol. 37, pp. 1-15.

Stevenson, J.C. (2003a) Berufliches Wissen / Vocational Knowledge, in F. Achtenhagen & E.G. John, eds., Meilensteine der beruflichen Bildung / Milestones of Vocational and Occupational Education, Vol. 1: Die Lehr-Lern-Perspektive / The Teaching-Learning Perspective (Chapter 3, pp. 43-69), W. Bertelsmann Verlag GmbH & Co. KG, Bielefeld, Germany.

Stevenson, J.C., ed. (2003b) *Developing Vocational Expertise*, Allen & Unwin, Sydney.

Stevenson, J.C. (2003c) The implications of learning theory for the idea of general knowledge, *Journal of Vocational Education and Training*, vol. 55, no. 2, pp. 65-77.

Stevenson, J.C. (2005) The centrality of vocational learning, *Journal of Vocational Education and Training*, vol. 57, no. 3, pp. 335-354.

Stevenson, J.C. (2007) Making meaning in workplace settings, in M.Osborne, ed., *Pedagogy of Lifelong Learning* (pp. 41-54), Routledge, London.

Stevenson, J.C. and McKavanagh, C. (1994) Development of student expertise in TAFE colleges, in J.C. Stevenson, ed., *Cognition at Work: The development of vocational expertise*, National Centre for Vocational Education Research, Adelaide.

Tight, M. (1996) Changing concepts in adult education, *Studies in Continuing Education*, vol. 18, no. 1, pp. 59-72.

Tertiary Education Commission (1979) *TAFE and Training for Skills: A Discussion Paper*, Australian Government Publishing Service, Canberra.

The National Training Board (1990) *Setting National Skills Standards: A Discussion Paper*, National Training Board Ltd., Canberra.

The National Training Board (1991) *National Competency Standards: Policy and Guidelines*, National Training Board Ltd., Canberra.

Tuomi-Gröhn, T. and Engeström, Y., eds. (2003) *Between School and Work: New Perspectives on Transfer and Boundary-Crossing*, Pergamon, Amsterdam.

Tyler, R. W. (1949) Basic *Principles of Curriculum and Instruction*, Chicago University Press, Chicago, Illinois.

Van Oers, B. (1998) From context to contextualisation, *Learning and Instruction*, vol. 8, no. 6, pp. 473-88.

Vygotsky, L. (1986) [1934] Thought and Language, trans. and ed. A. Kozulin, MIT Press, Cambridge, England.

Walker, D (1971) A naturalistic model for curriculum development, *School Review,* vol. 80, no. 1, pp. 51-65.

Wheelahan, L. (2007) How competency-based training locks the working class out of powerful knowledge, *British Journal of Sociology of Education*, vol, 28, no. 5, pp. 637-651.