Chapter 25
From Craftsmanship and Novices to 3D Printing and an Ageing Workforce – Is Vocational Education and Training (VET) Research Keeping Pace with Change as Well as Continuity in Work?

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Abstract Changes in work technologies, the way work is organized, and the nature, distribution and utilization of occupational skills and knowledge have always had an impact on VET practice and policy. VET research is concerned with exploring continuity as well as change. This chapter offers a reflection on how the interplay of change and continuity might require a more substantive and relational approach across the VET landscape. It questions whether VET researchers are sufficiently concerned with the life and practices of contemporary workplaces. The chapter tentatively suggests that it is time for some recalibration of the way VET research is conceived and organized in order to have a broader influence on policy and practice at both a national and international level. A focus on work might also offer a way to overcome some of the difficulties involved in comparative VET research.

1 Introduction

One of the attractions of being a researcher in the field of VET is its interconnectedness with the dynamic, diverse and contested contexts in which people work and in which goods and services are produced. The use of the term 'work' is, of course, highly problematic – are we referring only to paid work or do we, for example, include that which occurs in the home or through volunteering? Do we include in our scope the expanding world of self-employment and so-called portfolio workers? The formation, practice and sharing of expertise are themes that fascinate many VET researchers and they cut across the work contexts of everyday life, from paid

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work through to domestic routines and on into the myriad of leisure pursuits that nurture people's physical and mental well-being.

By foregrounding the study of work in this chapter, my aim is to ask to what extent VET policy and research have become overly concerned with analysing the institutional components within and across national systems. Such questions are problematic, of course, because there is a great deal of research in individual countries that lies below the international VET research community's radar. This is partly due to language barriers, but also because substantial amounts of detailed research gets reported within doctoral theses and other forms of unpublished literature. A further question for this chapter, therefore, is to ask to what extent it might be possible to bring more in-country research onto the international stage. Pilz (2012, p. 582) reminds us that, "(…) unlike other elements in the education system, vocational training is difficult to account for and analyse in an international context," but he continues "Yet if this disadvantage is used positively, we can derive perspectives that point to fruitful comparative research in the future" (Pilz 2012, p. 582).

A focus on work might offer a way to overcome some of the difficulties that Pilz identifies that can problems for cross-country comparative VET research (Billett 2011).

As a researcher from the United Kingdom (UK), I have to acknowledge the potential irony in questioning whether VET research is overly concerned with continuities and has neglected to sufficiently consider the implications of workplace change. The UK's VET system is well known internationally and certainly in European education research circles for being in a permanent state of revolution. The very use of the term 'system' may cause some UK scholars, teachers, trainers and employers to smile, for the key characteristics of the UK's approach to VET since the state began to take an interest at the turn of the twentieth century have been that of voluntarism and of "letting a thousand flowers bloom". We are in the curious position of having a notably complex and chaotic "system", which lacks the stable social partnership structures and dedicated institutions found in many other European countries, yet, paradoxically, since the late 1970s, VET has been subject to a highly centralised and frenetic policy regime (Keep 2006). As a consequence, a great deal of VET research in the UK has focused and continues to focus on policy critique, with far less space given to investigating the curriculum and pedagogical challenges facing teachers and trainers.

VET policies and practices have, by necessity, adapted and changed over time in relation to both changes in work technologies, to the way work is organized and the nature, distribution and utilisation of skills and knowledge. Yet some VET practices would look remarkably familiar if viewed by apprentices and VET students from many years ago. This is partly to do with the resilience and continued relevance of some pedagogical approaches and disciplinary-based curricula. Likewise and relatedly, there are resilient threads in VET research. These include investigations into the relationship between theory and practice, the continued intransigence of gender segregation, the role and evolving nature of apprenticeship, the relationship between VET and general education, including higher education, and the status of VET. Since

the late 1970s, notable continuities have been a concern to research the impact of labour market change on young people, the meaning and assessment of competence, and the professional identity of VET teachers and trainers.

It is surprising, however, how relatively little VET research is concerned with the life and practices of contemporary workplaces. In seeking to stimulate a debate about the scope of VET research, this chapter tentatively suggests that it is time for some recalibration of the way VET research is conceived and organized. The use of the term 'recalibration' might seem strangely mechanistic as its English dictionary meaning relates to the way measuring instruments are adjusted to bring them back into line with a specific standard when irregularities have been identified. The term seems to suit my purpose, however, in suggesting that it might be useful to review the relationship between VET research and work so that we can debate how close, how loose, how flexible we want that relationship to be.

2 Craft as an Evolving Work Process

In seeking to raise questions about the extent to which VET research sufficiently engages with work, I want to begin by acknowledging the wider educative and cultural purposes of VET (Gonon 2012; Unwin 2004; Winch 2000). This is necessary not just because VET can and should unlock the door into a broader, yet associated world of learning, but also because many forms of work can be educative and provide significant contexts for self-fulfilment (Hyland 2011; Unwin 2009; Livingstone and Sawchuk 2003). Dewey's (1938) argument should still be uppermost in the minds of policymakers and teachers and trainers: that vocational education provides a means through which people can consider what kind of lives they want to lead and, hence, identify the type of skills and knowledge they will need to acquire to achieve their goals. For Dewey, vocational education was more than the means to develop the skills and knowledge required to enter an occupation. It was the means to develop an understanding of the historical and social meanings of that occupation, paid or unpaid.

There are connections here to the decision that some people make to work in traditional crafts (e.g. jewellery, hand-made furniture, bakery, shoemaking etc.) and age-old industries such as fishing and forestry. The fashioning of beautiful bespoke objects is, of course, also big business (as the demand for expensive handbags and watches testifies), whilst in a different but related way, the enduring appeal of craft markets and the rise of the 'artisan' food merchants, the 'slow food' movement, and specialist coffee baristas maintains the presence of craftsmanship in contemporary town centres round the world. In the period following the 2008 international financial crisis when many countries were introducing austerity measures, the global market for luxury goods was booming. In 2012, the 75 largest luxury goods companies enjoyed sales of 171.8 billion USD, a growth of 12.6 % (Deloitte 2014). These figures are a stark illustration of the increasing polarisation between the global super rich and the majority of people. Throughout history, an important way for the

rich to demonstrate their wealth was through their display of luxury items and today that can be achieved through the cache of the handcrafted artefact.

On the website of Mulberry, the UK's largest manufacturer of luxury leather goods, the company promotes the continuing attraction of the handcrafted handbag:

> The sewing machines and cutting presses may be more modern, but there is no automated machinery, no computer controlled technology, no robot than can produce a handbag. At the heart of each production line is a Mulberry team, working together. (http://www.mulberry.com/making-mulberry)

Similarly, though with a stronger focus on the weaving together of heritage and contemporary technology, the website of the luxury Swiss watchmaker, Patek Philippe, declares:

> Independence, tradition, innovation, quality and craftsmanship, rarity, value, aesthetics, service, emotion and legacy are the fundamental values of the Genevan watchmaker. Patek Philippe has always aimed for perfection by creating timepieces of unrivalled quality and reliability, the uniqueness and exclusiveness of which makes them rare and precious pieces, a unique legacy to be handed down from one generation to the next. To achieve this, the company invests in innovation with new materials and leading-edge technologies, while continuing to preserve the tradition of ancestral watchmaking know-how, and maintains the industry's strictest quality control standards. (http://www.patek.com/en/company/the-manufacture)

In a very different sector, the same sentiments can be found on the website of the UK aerospace manufacturer, Rolls-Royce:

> At Rolls-Royce, our people craft amazing technology, every day. They deliver vast projects, make exquisitely crafted components, perform astute accounting analysis and oversee complex supply chains. And they never stop looking for ways to do all of it better, smarter and faster. It's challenging work for passionate people, and our trainee programmes are a great way to get started. (http://www.rolls-royce.com/careers/students-and-graduates/apprenticeships.aspx)

Apprentices joining these companies will be inducted into communities of practice where their VET will look to the past as well as the future. It would be reasonable to assume that they will also develop the satisfaction that comes from producing goods and services they can take pride in. As Sennett (2008, p. 9) has argued:

> Craftsmanship may suggest a way of life that waned with the advent of industrial society – but this is misleading. Craftsmanship names an enduring, basic human impulse, the desire to do a job well for its own sake.

In addition, he has written:

> The slowness of craft time also enables the work of reflection and imagination – which the push for quick results cannot. Mature means long; one takes lasting ownership of the skill. (Sennett 2008, p. 295)

Sennett's evocation of craftsmanship[1], which forms part of his critique of the impact of capitalism, has been criticised for being overly romantic and nostalgic about how

[1] There is no easy way to overcome the sexist terminology within the scope of this chapter.

far a return to work based on what he claims to be the values and ethics of craftsmanship (Lorenz 2010), and, relatedly for misinterpreting Hannah Arendt's distinction between *animal laborens* (the worker as drudge) and *homo faber* (the person who oversees and judges the worker's output). Yet his book, *The Craftsman*, was successful in reaching out beyond the academy to a wider readership interested in reclaiming the sense of work satisfaction that seemed to be part and parcel of being a craftsman. In addition, it connects to the related concept of 'job crafting', which is being used to capture the ways in which some workers in low-grade and low-paid jobs reject the prescribed limitations of their job descriptions and find ways to demonstrate and utilise their skills (Wrzesniewski and Dutton 2001). Similarly, in his discussion of Sennett's thesis, Schwalbe (2010, p. 109) conceives the meaning of "craft" as spanning a continuum from what he calls "artisan craft" ("craftswork in its fullest sense") to what he calls "niche craft" at the other. He explains the term "niche craft" as follows:

> Despite the formal limits of jobs, people may carve out microspheres of craft – areas of activity in which they can invent, solve problems, and learn new things, even if no-one notices. This kind of activity, call it niche craft, needs to be studied if we want to understand how jobs shape people. (Schwalbe 2010, p. 109)

VET research and practice will continue to have strong connections to the role and meaning of craft, whether in relation to the production of watches and handbags or aerospace engines. As we saw from the Rolls-Royce quotation above, the concept of craft transcends time, being equally suited to the precision required for technologically advanced manufacturing as for a bespoke piece of clothing or furniture.

3 Changes and Continuities in Work

Yet VET also has to contend with the continuities of the labour process. These include the negative aspects of what Brown and Scase (1991) have called "poor work", the relationship between the evolving and contested concept of "skill" and social class, race and gender (Seddon et al. 2010; Clarke and Winch 2007; Bensman and Lilienfield 1991), and the deep-rooted inequalities in labour markets (Berg 2015; Lloyd et al. 2008).

As Green (2006) has shown, in advanced economies, whilst the skill requirements of many jobs have increased, so too has the intensification of work effort leading to falling levels of job satisfaction and the amount of discretion that employees are afforded to manage and influence their work tasks (Brown et al. 2011). He refers to this as the "paradox of job quality in the affluent economy" (Brown et al. 2011, p. 3). Standing (2011) has coined the term 'the precariat' to describe people who earn their living through a series of short-term jobs and without the safety net of employment and social welfare protection associated with occupational stability.

From the findings of a survey on the future of work involving 10,000 people in China, India, Germany, the UK and the US, and of 500 Human Resource profes-

sionals, the global accountancy firm, PWC predicts a shift to three "worlds of work": the orange world where "small is beautiful" and companies break down into a "collaboration of networks of smaller organisations" and "specialization dominates the world economy"; the blue world where "corporate is king" and "big company capitalism rules as organisations continue to grow bigger and individual preferences trump beliefs about social responsibility"; and the green world where "companies care" and "social responsibility dominates the corporate agenda with concerns about demographic changes" with "climate and sustainability becoming the key drivers of business" (PWC 2014).

Gazing into crystal balls about the future of work has a long history, partly concerned with a desire to achieve a utopian state in which people would not have to work, and partly concerned with the destruction of jobs through mechanisation. In England, a group of textile workers known as the 'Luddites' came to fame in 1811 when they began attacking new machinery entering the hosiery and woollen mills in Nottinghamshire, Yorkshire and Lancashire. In 1817, the political economist, David Ricardo, who had initially regarded the growth of machines as a positive economic development, struck a more pessimistic note, arguing in his book, *On the Principles of Political Economy and Taxation,* that "the substitution of machines for human labour is often very injurious to the class of labourers" and that the "same cause which may increase the net revenue of the country, may at the same time render the population redundant". The current levels of youth unemployment (estimated at 73.4 million in 2013) across the globe are a stark reminder of the continued impact of economic change. The ILO (2013, p. 2) has commented that "In advanced economies long-term unemployment has arrived as an unexpected tax on the current generation of youth".

Thirty years ago, Piore and Sabel (1984, p. 17) argued that the developed world had entered the "second industrial divide" in which both white-collar and blue-collar workers were at risk. They called for governments to take the decisions necessary to generate a radical shift away from standardised mass production to what they termed "flexible specialisation", which they argued "…is a strategy of permanent innovation: accommodation to ceaseless change, rather than an effort to control it". They continued:

> This strategy is based on flexible – multi-use – equipment; skilled workers; and the creation, through politics, of an industrial community that restricts forms of competition to those favouring innovation. For these reasons, the spread of flexible specialization amounts to a revival of craft forms of production that were emarginated at the first industrial divide. (Piore and Sabel 1984, p. 17)

This evocation of the concept of "craft" returns us to the earlier discussion about how people find meaning in work. Similarly, in their critique of the breakdown of the human capital promise that higher levels of education would enable individuals to secure high level jobs, Brown et al. (2011, p. 160) argued that governments have economic and political choices to challenge the "winner-takes-all society".

Today, it is the rapid spread of digitization including the increasing use of robots that is causing concern (Ford 2015). In their assessment, Brynjolfsson and McAfee

(2015) argue that this will have a profound impact on the nature of a great deal of work and that: "…there's never been a worse time to be a worker with only 'ordinary skills and abilities to offer', because computers, robots and other digital technologies are acquiring these skills and abilities at an extraordinary rate". Similarly, Frey and Osborne (2013, p. 45) that:

> As technology races ahead, low-skill workers will reallocate to tasks that are non-susceptible to computerisation – i.e., tasks requiring creative and social intelligence. For workers to win the race, however, they will have to acquire creative and social skills.

Rather than the radical economic and political change advocated by Piore and Sabel (1984) and by Brown et al. (2011), we see here the mantra that continues to be popular with policymakers that it is individuals who will need to change rather than the quality of jobs and the quality of workplaces. Thus the concept of "transferable skills" (also known as "soft skills", "generic skills", "interpersonal skills" and "life skills") continues to be promoted (for critiques see Guile 2010; Hodkinson and Hager 2009; Canning 2007).

For VET research, as well as for VET practice and policy, workplace change troubles our understanding of the concepts of skill and knowledge more generally. The shift into a post-industrial era in which service sector employment has come to dominate national economies, gives new momentum to the notion of 'soft skills'. The seeming clarity of skills and knowledge associated with occupational fields such as accountancy, engineering or hairdressing is disturbed by the rise of the knowledgeable consumer or client armed with information from the internet. New processes such as 3-D printing (also known as additive manufacturing) offer consumers the chance to create products at home as well as in the advanced manufacturing workplace, including the medical laboratory. For the VET researcher, gaining access to the workplace has become ever more important, both in order to maintain an understanding of the implications for VET of technological and other changes to the work process, and also to develop and refine the conceptual analytical frameworks required to critique those changes and to expose the underlying continuities.

4 Research in the Workplace

Alison Fuller and I have argued that vocational learning environments can be analysed through the use of the 'expansive-restrictive framework' (Fuller and Unwin 2004a). The framework originated in our qualitative research on why apprentices, even within the same sectors and on seemingly equivalent apprenticeship programmes, were having markedly different experiences. We extended our research to include early career and trainee professionals (Fuller and Unwin 2014). We argued that the standard front-loaded model of professional education, which presumes that the core knowledge and skills are attained in an educational setting before entering the workplace or, at best, in the classroom in breaks from the workplace, erroneously assumed that all "professional" workplaces would offer the same affordances

for learning. We then built on those ideas using the concept from economics of the "productive system" to show how all workplaces are affected by the position they occupy within a specific productive system (Felstead et al. 2009).

The concept of a productive system is based on the interrelationship between the social networks (internal and external to the workplace) through which the production and consumption of goods and services (in both the public and private sectors) is organized. This identifies the patterns of power and control that flow through the productive system. The key purpose of the 'expansive-restrictive' framework is to enable those involved with workplace learning and VET to analyse a workplace's characteristics as a means for evaluating the potential for offering a conducive environment for learning (both for individuals and teams). Furthermore, the analysis points the way to the types of action that might be taken to shift the workplace towards becoming a more 'expansive' learning environment. A notable characteristic of an 'expansive' environment is the amount of discretion that individuals have to conceive, execute and reflect on their work and to be trusted to make judgements as part of their everyday work activity.

The vocational educator often has to work within and across different productive systems, those of their home institution and of the workplaces they visit to monitor, support and assess learners. Hence, their pedagogical and curriculum design expertise has to adapt to and mediate between:

- Classrooms,
- Workshops,
- Simulated environments,
- Workplaces.

This mediation also involves recontextualising the way skills and knowledge are defined in the workplace so that they can be further developed in classroom or workshop settings (Evans et al. 2011).

Whilst gaining access to workplaces can be very time-consuming and can involve sensitive negotiations in terms of the level of freedom that a researcher will have, the benefits can be considerable. There is much that the funders of research need to do to acknowledge the costs involved and it may be that there is untapped potential for developing more collaborative research and development (R&D) strategies involving both VET researchers and practitioners. If more of this could be done on an international comparative basis then this would help to transcend the difficulties of cultural and institutional translation alluded to by Pilz (2012).

5 Questions of Age and Stage

In many countries, VET is still positioned within the state education system and regarded as primarily for the skill formation of young people. Yet vocational education can enter people's lives at different points and have different purposes, from an

introduction to work through to advanced practice. Another way in which VET is having to adapt to changes in work is in response to the fracturing of the modern era's linear life course trajectory of education-work-retirement (Unwin et al. 2015; Evans and Helve 2013; Field et al. 2013). There is now an expectancy that more people will have to engage in paid work (and hence further training) beyond standard retirement age, a concept which itself has been abandoned in some countries. The UK and Australian governments both fund so-called adult apprenticeships, which include people from age 16 through to 60 and beyond (Fuller et al. 2015; Karmel 2006).

In the research literature as well as in policy documents from national governments and supra-national agencies such as the European Union and the OECD, VET is still often divided between the concept of initial VET (IVET) and continuing VET (CVET). This division is also reflected in national structures where IVET tends to be dominant (Cedefop 2015). Whilst there is a justifiable basis for differentiating between the needs of young people in transition from education to work and adults who are in need of updating their skills or retraining to switch to a new or move within a new occupational field, the long-standing age and stage distinctions should be subject to some reappraisal.

The age and stage distinction is also reflected in the theories of learning that inform VET research and practice, perhaps most notably in Lave and Wenger's conceptualisation of the apprenticeship journey within a community of practice as being a trajectory from novice to expert ('old timer'). We know, however, that although Lave and Wenger's conceptualisation was necessary in order to identify and describe the ways in which "novices" moved from the status of being "legitimate peripheral participants" to becoming full members of their occupational community, it presents an ideal type. In reality, the pace and nature of an apprentice's trajectory, as would be the case with any other learner, is unique (Fuller and Unwin 2013). This is partly due to the individual's disposition and partly due to the nature of the workplace and the occupational field. In addition, some young people bring skills and knowledge (notably in relation to digital technology) into the workplace which may put them in a position where they can actually teach an 'old timer' something new (Fuller and Unwin 2004b). The generational dimension of contemporary workplaces in which young people and increasingly older workers experience work and learning together poses pedagogical questions for VET as well as for the way VET programmes are designed.

6 Conclusion

In this chapter, I have argued that it is perhaps time for some recalibration of the way VET research is conceived and organized in order to have a broader influence on policy and practice at both a national and international level. My main proposal is for a stronger focus on work. Apart from the relevance of this for enabling VET

research to have a greater influence or even to gain greater recognition, I have also suggested that a shared interest in work offer a way to overcome some of the difficulties involved in conducting comparative VET research. In arguing for a stronger focus on work, I am not echoing the continued call from policymakers for VET to become 'more relevant' by moving closer to the requirements of the labour market. My purpose is somewhat different, though it would also facilitate a closer, though not necessarily an easier relationship. We need more detailed studies of work to inform our theories of the purpose and nature of VET so that VET can continue to support skill formation, but also so that VET can provide a critique of how skills and knowledge are being utilized.

In preparing this chapter and the keynote presentation from which it arises, I was stimulated by a parallel study I am doing with colleagues on the relationship between VET, knowledge and innovation in regional economic development (see Guile et al. forthcoming). We are drawing on insights from the literature on Territorial Innovation Models (TIM) in the field of Economic Geography and the shift that has taken place within that research community from systems to practices. Our argument is that in order to understand the processes that enable knowledge to play a dynamic role in regional economic development, we need to focus on the generative role of social practices.

One of the illustrations we are using is Crevoisier and Jeannerat's (2009) case study of the Swiss watch industry. This explains how in the early 1980s, the industry was threatened by the growth and success of the Japanese watch industry, which had taken advantage of the development of quartz technology in the 1970s. Employment in the Swiss industry fell between 1970 and 1984 from 90,000 to 30,000, and the number of enterprises dropped from 1600 to about 600. The Swiss watch manufacturers responded by re-imagining the purpose of a Swiss watch. They focused on the value (the authenticity and the aesthetic appeal) of their historic craft tradition, whilst also deploying new synthetic knowledge to institute cross-industry technological improvements and modularise production. At the same time, they collaborated with the fashion industry and other producers of luxury goods to broaden the types and levels of expertise required to shift into a new way of working. The combination of craft heritage and modern technology meant they drew on long-standing VET practices of skill formation as well as requiring the learning of new techniques required to meet new production standards.

The Swiss example contains the element of change and continuity that I have tried to weave through this chapter. Occupational expertise is a dynamic, mysterious and evolving phenomenon and it demands constant attention. Its development rests on sustained practice over time and relies on inputs and support from adaptable vocational teachers and trainers who themselves have the space, time and resources to sustain their own professional and pedagogical expertise. Just as in the Swiss example, VET can continue to evolve whilst still being anchored in shared traditions and values, but it needs to draw on and collaborate with people, places and ideas beyond its own national and research community comfort zones.

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