

Addressing the workforce performance requirements of the post-industrial workplace

Paul Brady, MECAT Curriculum Centre, TAFE NSW

Abstract

This paper is part of a Ph.D. thesis undertaken at Macquarie University. A transformation of the Australian VET system took place in response to a perceived need for a highly skilled workforce to drive an internationally competitive economy. This transformation however has been undertaken without fully defining the performance requirements of the post-industrial workforce. Without such a definition, it is difficult to fully evaluate the effectiveness of the transformation and address improvement. This paper addresses what this performance is. A starting point was adopting a concept of performance. A range of concepts exist each of which leads to different definitions of performance. As significant criticism existed from many researchers about the behaviourist concept of performance generally called *competence*, this study adopted a concept of performance termed *capability* modified from a concept developed by Professor John Stephenson in the UK. The modified concept addressed a range of perspectives about performance. The study explored the nature of the post-industrial workplace from literature and deduced a set of attributes that are required by workers. Using a modification to a framework developed by Peter Kearns, the attributes required for the post-industrial workplace were arranged under the parameters of the framework. This framework was used to ensure that a definition of post-industrial capability was holistic in nature to satisfy the concept of capability. The overall framework produced is termed *post-industrial capability*. The definition of post-industrial capability provides a useful benchmark to measure not only the performance of the Australian VET system including its elements such as Training Packages but also any improvements to this system.

Introduction

In the latter part of the twentieth century, globalisation impacted heavily on developed countries like Australia causing significant changes to their economic activity. This has generally been referred to as a shift from an industrial to a post-industrial economy albeit the extent of the shift varies between workplaces. This shift has called in turn, for a different performance from the workforce. Recognition of this workforce performance change has resulted in many nations including Australia transforming their technical and vocational education systems. The Australian VET system introduced an entirely new approach to the design of training through the Australian competency based training (CBT) system. However, the introduction of the Australian CBT system remains a solution to a need that has itself not been substantially defined. Hence evaluation and improvement of the Australian CBT system is problematic in the absence of goals to be achieved. This paper addresses what these goals are namely the performance that is needed by school leavers for Australian urban post-industrial work.

Literature Review

This research is primarily based upon existing literature. An in-depth analysis of current literature did not reveal any statement that defines the overall performance needed by school leavers in the post-industrial era. Whilst there is considerable literature that deals with individual/ sets of work attributes of the post-industrial era or generic/employability skills, none focus on the totality of performance required for the post-industrial era. The studies on work attributes or generic/employability skills also do not generally make explicit the concept of performance upon which they are based.

Literature (for example, Dall’Alba & Sandberg, 1996; Hager, 1993a; Stephenson, 1992; Velde, 1999) shows that there are many concepts about performance. The behaviourist concept for example, underpins the Australian CBT system. The behaviourist concept regards overall performance as being reducible to a set of discrete individual observable behaviours. In turn, attainment of each individual behaviour in the set means achievement of overall performance. This approach has been generally described as atomistic and tends to lead to lists of behaviours. The key competencies, employability skills and units of competency in Training Packages display the characteristics of behaviourist thinking in so far it is considered each can be separately observed and measured. Literature shows significant criticism of the behaviourist concept of performance (for example, Ashworth, 1992; Ashworth & Saxton, 1990; Hyland, 1994; Schofield & McDonald, 2004). These authors generally conclude that performance is complex and cannot simply be reduced to lists of attributes.

There is a range of concepts about performance that adopt a more holistic approach. Hager (1993a) for example advocates a holistic approach incorporating a level of measurability. Another viewpoint regards performance as embedded in the context of work and the students’ interpretation of that context (Velde, 1999). In this regard, Dall’Alba and Sandberg (1996) regard performance as an entity formed through the experience of the task or work. This raises another important distinction in concepts of performance between knowledge being held by individuals and knowledge being held by an organisation (Matthews & Candy, 1999). It is possible therefore to talk about the performance of an organisation upheld by implicit and explicit knowledge, as well as the performance of individuals. Another important distinction in a concept of performance is the contribution to a given enterprise and the individual’s ability to have a fulfilling career.

The *capability* approach (Stephenson, 1992) is an attempt to create an alternative holistic concept of performance. Capability as defined by Stephenson, is a complex construct of specialist expertise, a confidence to apply knowledge and skills within varied and changing situations and, an ability to continually learn. However Stephenson’s use of the term capability is limited, because it relates to performance in a higher education institution and lacks measurability, as it does not provide details about performance other than broad based statements to help in the development of educational programs.

The researcher addresses these problems through modifying Stephenson’s concept in the following ways:

- Defining capability as overall performance within an occupational role in the workplace.
- Adding measurability by providing an identification of the elements that comprise capability that are referred to as abilities.
- Preserving holism through regarding the abilities as fused. Although fused in a totality, abilities can nonetheless be recognised.

To achieve both a level of holism and measurability, the researcher sought a schema. A schema developed by Kearns (2001) was the only suitable one found. The Kearns schema is a cluster of key generic skills that coincide with the broad based and non occupational specific abilities. Whilst a significant level of literature as mentioned above has identified specific abilities that are needed, the Kearns framework is unique in classifying and relating clusters to each other. The Kearns' schema does not claim to be a statement on the abilities needed for the post-industrial workplace, as its focus is on generic abilities. However generic competencies are a significant part of capability. The researcher consequently found that the Kearns' schema was useful in classifying most of the abilities required for the post-industrial workplace. By modifying this schema to include the parameters of occupational specific skills and critical thinking, it was possible to create a new framework that addresses capability.

The identification of abilities drew on a wide range of educational and management literature about the economy (for example, Boston Consulting Group, 1995; Brown & Lauder, 1996; Mathews, 1989) and the abilities required for work (for example, The Allen Consulting Group, n.d.; Australian National Training Authority [ANTA], n.d.; ACCI & BCA [Australian Chamber of Commerce and Industry and Business Council of Australia], 2002; Gow & McDonald, 2000; Hull & Matthews, 1997; Kincheloe, 1995; Smith et al., 2002; UNESCO & ILO, 2002). The study is thus a synthesis of literature from a neo-liberal, human capital and critical pedagogy set of perspectives.

Research Method

The overall approach of the study to define post-industrial performance has been achieved through:

- Adopting a concept of performance.
- Analysing the nature of both industrial and post-industrial era work.
- Reflecting on the nature of the industrial and post –industrial work.

The study analysed the nature of industrial and post-industrial era work as a basis for determining the required capability for each era. The distinction between the two eras was made, for analytical purposes only to highlight general tendencies that apply to varying degrees to different workplaces. This analysis employed a futurist approach developed by Slaughter (1986) who advocated an exploration of the values and paradigms over a period of 100 years either side of the present, to achieve an interdependence of time periods of the past, present and future. The study achieves this through exploring the world economy and the nature of work over a two hundred year

period. This enables the analysis to not only address the present post-industrial period as an evolution from the industrial period, but also to provide a level of projection into the future. Moreover through contrasting the nature of work in the post-industrial with that of the industrial era, this study was able to highlight the nature of post-industrial work.

Through reflection on the nature of work and the use of literature mentioned in the literature search, a list of abilities required for both industrial and post-industrial work was developed. The abilities were then classified into seven parameters within a framework adapted from one developed by Kearns (2001). The resultant frameworks are subsequently referred to as industrial and post-industrial capability

Findings and Discussion

The Appendix provides a definition of post-industrial capability. Overall the analysis reveals a significant change in the performance expected of workers in the post-industrial era to that of the industrial era. Each era is discussed in turn.

Industrial Era

The industrial era was typified by high levels of stability in products/services and processes. Employment was generally full-time and often for life within the one organisation. The largely static nature of work enabled it to be standardised and organised within hierarchical structures. The overall performance expected can be summarised as follows: ability to take instructions and convey information to supervisors; ability to deal with monotony, repetition and routine work; ability to work alone; ability to focus solely on performing function to the technical specifications provided; and, possession of technical skills related to the function performed.

The industrial era resulted in the genesis of VET systems to provide training for skilled workers. Courses were highly defined to accommodate the demarcated nature of work.

Post-Industrial Era

The post-industrial era is typified by rapid change in products/services and processes. The dynamic nature of the workplace and the need to reduce costs, has led to fewer layers of management to organise activity resulting in the workforce having significant responsibility in managing their own work. Consequently, the performance expected of the workforce has also changed. In all parameters of capability, there are significant differences both quantitative and qualitative between the industrial and post-industrial eras (see Appendix). Key performance areas where post-industrial workers differ to those in the industrial era are: making decisions; working in teams; possessing flexibility and adaptability; capacity to continually learn; and, possessing a customer mindset. In respect of the parameter of work readiness and work habits (see Appendix), the post-industrial worker is expected to have a range of abilities that support overall performance in an environment of changing functions and employment. Whilst the industrial era worker had few responsibilities, the post-industrial worker is required to accept significant

responsibility in the functions that are carried out. Workers are expected to quickly adjust to new functions and self manage their work activity. Taking responsibility involves making appropriate decisions leading to a need for significant base knowledge about technology, workplace systems and the ability to quickly access new knowledge. Overall, the complexity of post-industrial work is dependent on numeracy, literacy and computer literacy skills.

With a significant level of post-industrial work taking place in teams, individuals, require significant interpersonal skills including intercultural ability and the ability to interact. The overall communication patterns are also related to the generation and retention of knowledge. Whilst industrial era planning departments and supervisors could be said to be the holders of workplace knowledge, it is more likely that the post-industrial workforce in general holds a significant level of knowledge about product, services and processes. Indeed competitiveness demands that knowledge acquired is continually captured by the enterprise (The Allen Consulting Group, n.d.). The responsibilities of workers now mean they need to be able to support learning in the workplace and the capacity to continually learn themselves.

Unlike the industrial era, workers in the post-industrial era have significant social responsibilities. In the industrial era, workers focused on a technical function largely because the world of work and the environment were largely separated. Post-industrial enterprises however have significant social responsibilities partly driven by regulations such as occupational health and safety and the environment (Chappell et. al., 2004). Workers in turn have to make decisions that comply with these requirements which require a significant level of analysis. Workers also now operate in a much broader environment than their counterparts in the industrial era. Increasingly in the post-industrial era people are contractors rather than employees, as was the case in the industrial era. Consequently, they now need to be able to analyse what is happening within a given enterprise as well the broader industry to gain appropriate income and working conditions and, to make appropriate decisions to satisfy workplace and community expectations (Kincheloe, 1995). The study uses the term *critical thinking* to reflect the analytical skills required.

In respect of the parameters dealing with autonomy/personal mastery/ self direction and enterprise/innovation and creativity skills, negligible performance was expected of the industrial era worker. Flat structures place far greater responsibility on the post-industrial worker especially the capacity for decision making. Continual change in products/services and processes results in workers generally in groups continually problem solving and seeking improvements to production. According to Roffe (1999), this requires an overall ability to solve problems as a whole rather than from a narrow perspective such as a task or given work function. Constant change in products and processes leaves little time to developing standardised solutions to problems as was the case in the industrial era. Whilst there will be routine problems, there will be many problems that are not routine and for which there will be no known solutions. The solving of the later requires higher order problem solving skills (Stevenson, 1994). There is an

added dimension of not simply solving a problem but being able to creatively arrive at solutions and improvements that enhance productivity.

The industrial era largely required the possession of highly defined technical skills limited either to a work station, or (in the case of trades), a demarcated area of work. A post-industrial worker is faced with constant change in functions due to changing products/ processes, the flexibility required in enterprises and contracted work arrangements. Consequently workers employ a much broader range of skills than what was the case in the industrial era. This suggests the possession of broad based industry/occupational area skills and knowledge (UNESCO & ILO [United Nations Education, Scientific and Cultural Organisation & International Labour Office], 2002).

Implications for the VET Sector

A key question is whether the VET system adequately addresses post-industrial capability. Certainly policy makers have not defined post-industrial capability and made this a key goal of the system. Rather there appears to an implicit strategy in the VET system of using the process of Training Package development as a mechanism to define desired outcomes. Current guidelines particularly require developers to address employability skills which correspond to the personal abilities of post-industrial capability, through defining the facets of each employability skill (DEST, 2005). However there is an inherent danger that Training Package developers including industry and training providers, may in the absence of an understanding of post-industrial capability, list the more easily definable work related skills and knowledge at the expense of the more complex behaviour. This can lead to the development of a performance that is below that required in a post-industrial working environment. For example, there are at least three dimensions to problem solving (Stevenson, 1994). One is problem solving for routine situations. Another is problem solving for non routine and unknown situations (higher order problem solving skills). An overarching dimension is creativity. In respect of problem solving, there will be a tendency to focus on the more definable routine problem solving at the expense of the other more complex dimensions.

Conclusions

The definition of post-industrial capability has drawn on a significant level of existing studies. It differs from previous studies in being based on a different concept of performance called capability and, addressing the overall performance expected in the post-industrial workplace. The value of the definition is that it addresses what the goals of the Australian VET system should be. It is however a conceptualisation and needs further research.

A key conclusion is that the Australian post-industrial economy demands an entirely different worker performance from that of the industrial era. The industrial era required individuals who could take instructions and perform technical tasks related to their function often without much interaction with others. The post-industrial era however requires a self-directed worker who creatively problem solves and makes ongoing

improvement within a team environment in conformity to community expectations. Post-industrial capability is a much more complex construct than industrial era capability. The analysis has revealed a requirement for breadth in technical ability, flexibility and adaptability, higher order problem solving skills, creativity, good interpersonal communication ability and a critical perspective of the working environment. The shift from industrial to post-industrial era capability is very much from a defined technical perspective to a complex of attitudes, social and organisational skills and broad technical ability.

The analysis has shown that post-industrial capability needs to be viewed as a complex construct rather than a set of individual observable behaviours. Although the abilities within each parameter provide a focus for learning and assessment, post-industrial capability needs to be addressed in a holistic way through each of the interlinked parameters. This poses significant changes to the way training is currently being delivered and assessed. Although the Australian Quality Training Framework and Training Packages address general competencies and parameters of performance, there is no requirement to link the latter in a holistic way. Post-industrial capability is most likely to be achieved through education institution or workplace project based activity that focuses on each parameter. The acquisition of higher order problem solving skills for example requires specific types of learning experiences. A key question is whether the VET system with its industrial era origins has sufficiently transformed its overall learning environment to address the complexity of post-industrial capability.

Acknowledgements

The author wishes to express thanks to Dr. Tony Koop and Dr. David Saltmarsh of Macquarie University for their guidance to the author whilst undertaking the Ph.D thesis.

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Appendix: Post-industrial Capability

Parameter	Abilities
Work Readiness & Work Habits	<p>Ability to plan and organise activities.</p> <p>Possession of self-management skills.</p> <p>Knowledge of workplace systems.</p> <p>Ability to select, apply, maintain and problem solve technology.</p> <p>Possession of literacy, numeracy and computer literacy skills.</p>
Interpersonal skills	<p>Good interpersonal skills.</p> <p>Intercultural ability.</p> <p>Possession of a foreign language.</p> <p>Capacity to work with others within a team environment.</p> <p>Ability to interact and communicate with others</p>
Enterprise, innovation and creativity skills	<p>Possession of a customer focused mindset.</p> <p>Possession of entrepreneurship ability.</p> <p>Ability to address problems as a whole rather than from the confines of a small work area.</p> <p>Capacity to be creative.</p> <p>Being resourceful.</p> <p>Possessing an improvement oriented mentality.</p>
Learning , thinking & adaptability skills	<p>Ability to continually learn.</p> <p>Ability to coach, mentor and give feedback</p> <p>Ability to facilitate training in the workplace.</p> <p>Capacity to value continuous improvement and change.</p>
Autonomy, Personal Mastery and Self- Direction	<p>Possession of a high level of flexibility and adaptability</p> <p>Ability to gather and analyse information in order to make informed decisions.</p> <p>Possession of higher order problem solving skills.</p>
Critical thinking	<p>Possessing a critical perspective.</p> <p>Understanding the external environment.</p>
Occupational Expertise	<p>Possession of broad based industry/occupational area skills and knowledge.</p>