Reviewing skills and knowledge: will the digital age mean a break with the past?

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The latest review of vocational education and training (VET) by Stephen Joyce (commissioned in November 2018, delivered in March 2019) calls for ‘a significant upgrade to the architecture of the VET sector so it can successfully deliver the skills needed for Australia’s future’. Joyce proposed ‘a new vision for vocational education in Australia as a modern, applied and fast-paced alternative to classroom-based learning’ (Joyce 2019, p.1). In so doing, the review, intentionally or not, implied that renovating the house of VET may not be the answer. An unanswered question hangs over the VET system: do the structures in which it operates need to be replaced? Even while recommending, as a short-term action, the formulation of a clearly defined vision of VET, the Joyce review did not contemplate a new foundation for that vision.

The Council of Australian Governments responded in August 2019 (COAG 2019), issuing the following vision for Australia’s VET system as one that:

a. Provides workforce skills and relevant, up-to-date qualifications that are well-matched to the evolving opportunities and challenges of Australia’s modern economy.
b. Is flexible in providing skills at all points in an individual’s career cycle whether it be foundational training, initial training, upskilling or re-skilling.

c. Delivers high-quality education and training for all learners in recognition that VET and higher education are equally valued pathways into employment.

d. Provides useful and accessible careers information that enables prospective learners and trainees to make informed decisions about their future.

e. Is responsive to the needs of private industry and the public sector, ensuring employers have ready access to a highly skilled and adaptable workforce, while acknowledging industry has shared responsibility for growing a skilled economy.

f. Provides VET qualifications to school students that are valued by employers and provides a clear pathway from school to careers that require VET qualifications.

g. Delivers positive opportunities and outcomes for all Australians regardless of geographic, social or personal circumstances. This includes access for learners in regional, rural and remote areas, and to foundational skills when individuals need them.

Yet again, officials are asking the VET sector to deliver a huge amount in all the areas where it keeps falling down, thereby prompting another review, another piece of legislation (since 1988 at least one for every single year) and further reductions in its share of overall education budgets, all within the same architecture of a federal ‘industry-led’ system of public and private organisations. Will it be radical changes in the formation and retrieval of knowledge that break the cycle?

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Revisiting 70 years of reviews of Australia’s VET system suggests that defining a genuinely new vision and implementation plan is not achievable at the quick pace of the Joyce review and the governmental response to its recommendations. As Robin Ryan (2019) argues in his survey of the landmark documents, the difficulties successive governments have faced since the mid-twentieth century in developing a coherent direction for VET derive from a failure to face up to fundamental questions about the role and purpose of the sector. He points, in particular, to the perennially unresolved ‘training’ or ‘education’ dichotomy.

That dichotomy is variously couched in terms of skills and knowledge; theory and practice; applied and academic learning; reflection and action; knowing and doing; competence and capability. That these things are not seen as two sides of the same coin needed to power the economy and society confounds the formulation of effective education policy. This is perhaps explained by the ever-increasing reliance on data and quantifiable outcomes in determining funding allocations to a field of endeavour, learning, that is so individual and idiosyncratic. The numbers do matter but so do the questions they prompt. These rely also on imagination and a spirit of humanism if we are to look for the right answers. Of the 37 reports so far listed on the VOCEDplus landmark documents timeline – more are coming – the one best remembered, the Kangan report (1974), is infused with exactly such a humanistic sensibility that saw the learner as a person, a worker and a citizen, as well as a statistic.

One of the other most comprehensive reviews (commissioned in 1961, finished in 1964) was undertaken by the Committee on the Future of Tertiary Education in Australia, chaired by Leslie Martin, a physicist, who started from this premise:
The human values associated with education are so well recognized as to need little elaboration, but the Committee emphasizes that they are the very stuff of a free, democratic and cultured society.

*(Martin report, vol.1, p.1)*

This was not an assertion of education for its own sake. Later, the report states:

The factors which determine national survival in the modern world require the Australian community to provide talented young people with opportunities to develop their innate abilities to the maximum. With its increasing dependence upon skills of all kinds, the community will rely upon their efforts for its future welfare. But more is required than proficiency in skills, for it is doubtful whether the people of any previous age have been confronted with social, national and international problems as complex and as far-reaching as those with which mankind is faced today; and these are problems which call for mature judgments by free and well-trained minds...

By the end of the 20th century, it is estimated that the world population will probably exceed 7,000 million. Such a growth underlines the importance of the study of people in their relations one to another. An understanding of the physical nature of the universe, and an ever-increasing excellence in the production of goods and services to satisfy man's material needs are, in themselves, only part-contributors to the good life in a mass society.

*(Martin report, vol.1, pp.2-3)*

This language may sound outdated (and gender-biased, although the Committee did examine the need to get more women into tertiary education), yet it articulates the same concerns being expressed in 2019 about the skills needed for the knowledge economy and to meet the demands of Industry 4.0: in a nutshell, people skills. Talk about the good life has receded from policy documents, although implicit in the emphasis on work is an assumption that having a job contributes not only to economic productivity but also to personal and community wellbeing. The attachment to a liberal education to underpin technical and professional learning that permeated the Martin and Kangan reports has also faded, even though the other set of skills now in demand relate to creativity and innovation. This has resulted in calls to add an A (arts) to STEM (science, technology, engineering and maths) education.

The rest of this essay could be about the labels attached to these various skills over the last half century. Suffice it to say, while their content may have changed as technology and work organisations evolve, the list has remained remarkably stable. In a very recent paper for the review of the Australian Qualifications Framework, the label is ‘enterprise and social skills’, which are listed as:

Qualities such as perception, creative intelligence, social intelligence, problem solving, resilience, communication skills, digital literacy, teamwork, presentation skills, critical thinking, creativity, financial literacy, communication, collaboration, problem-solving

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abilities, conscientiousness, civic consideration, global awareness, durability, grit and perseverance.


An accompanying paper prepared by the Department of Education (2018), talks about employers wanting in-depth disciplinary knowledge as well as broad-ranging skills and abilities. Their ideal employees are what Australia’s Chief Scientist, Dr Alan Finkel AO, calls T-shaped workers, where the vertical line of the T represents deep expertise in a discipline, which should be acquired first, and the horizontal line signifies the flexibility to apply that expertise creatively, as part of a team in a workplace, and to develop new skills. All these lists ask learners and educators to achieve a great deal, often in as short a timeframe as possible. This is one reason why some of the perennial issues tackled by policy makers remain unresolved and why Australia often resorts to migration to address skills gaps (Zoellner, 2019).

Despite plenty of evidence (Halliday Wynes & Beddie 2009) that informal learning is a substantial contributor to all skills acquisition, most policy documents concentrate on the formal education system and on qualifications. Similarly, even though the concept of lifelong learning was already being mooted in the 1960s (Martin report, vol.I, p.168), placing that concept into a public policy frame has proved difficult. The Business Council of Australia (BCA) suggested in 2018 (Business Council of Australia 2018) this might be addressed by introducing lifelong learning accounts: possibly a solution but only if its implementation could be designed to avoid misuse and worse. In Moving on: report of the high level review of training packages (2004, p.10), Schofield and McDonald observe:

For many individuals and enterprises, learning is now an integral and continuous part of working, and workplace learning already encompasses both informal and formal learning and increasingly will reflect both individual and collective competence. This suggests that education and training needs to be linked more systematically to wider human resource management strategies that promote new approaches to job design and work organisation and which explicitly support business strategies. Although learning through work will become increasingly important, work itself is not always conducive to learning. Employers and providers need to create programs and practices that lead to more work-conducive learning - learning which is highly context-bound, driven by specific and immediate work requirements.

Individuals are recognising this need to top up their skills to bolster their career prospects (if not yet so much to retain their current positions). The latest data (NCVER 2019) show that between 2015 and 2018, students undertaking subjects not delivered as part of a nationally recognised program increased by 46.6 per cent to 2.5 million in 2018. The sophistication of technology is also making it imperative that the workplace become a site of learning. TAFEs and other VET providers simply cannot keep up to date with the latest developments nor, without real-time understanding of their application in an enterprise, foster problem-solving and innovation.

2Apprenticeships, for centuries the bedrock of trades training, have been much scrutinised by governments, industry bodies and researchers, including in historical essays published on the VOCEDplus website. In this essay, I concentrate on the overall theme of vocational skills and knowledge, and the workplace as a site of learning.
Despite the ubiquitous emphasis on vocational learning, the rapidly changing landscape of work and the emergence of a mass market for higher education pose increasing challenges to VET providers to remain competitive both in terms of the market and of policy relevance. They need to adapt. The Skills Australia paper *Creating a future direction for Australian VET: a discussion paper* (2010, p.23) put this challenge the other way around. It suggested that making the workplace an effective learning site would mean changing the practice of VET. This would entail ‘developing new services for working with enterprises and supporting enterprise workforce development and innovation’. The paper also noted, as so many other reviews did, that its proposals had implications for VET practitioners, who may have to specialise in new areas, such as business improvement, organisation of work and redesign of jobs to improve the use of skills.

Shifts in work practice and changing technology also have implications for enterprise owners and managers, who need to be able to mobilise the talent they employ and recognise that the costs of supporting continuing professional education and development are an investment in their human capital. This is not a new requirement. Another refrain in the documents, and more broadly in discussion about Australian productivity, is a paucity of leadership and management ability in Australia. The Karpin task force spent three years (1992-1995) on consultations, study missions, research and analysis, in order to report on how Australia prepares its managers for work and leadership. It stressed that improved management skills were needed to underpin the government’s micro-economic reform agenda, and thus to create internationally competitive enterprises and improve living standards for all Australians.

Education and training were key to this: TAFE capability needed to be upgraded; Australia must ‘harness the talents of diversity’ and reform management education. This would require seed funding from government (*Karpin report*, p.xvi, p.1).

The research into the effect of management skills on productivity has continued (Green et al. 2009), sponsored in recent years by the Office of the Chief Economist in the Department of Industry. The findings are consistent: Australia has relatively weak management capability, especially in small and medium enterprises. Given the dominance of Management and Commerce as the most popular field of education for training package qualifications, with 567,000 (25.6%) enrolments in 2018 (NCVER 2019, p.10), getting VET to contribute to the systematic development of Australia’s leaders and managers warrants concerted action on this accumulated body of evidence. This is an obvious place for VET providers and industry to collaborate on new models of delivering much needed skills to workers throughout their careers.

It is individuals who ultimately effect change. This is a central message in the *Kangan report*, which recommended that:

> the emphasis in technical college-type institutions should be primarily on the needs of the individual for vocationally oriented education and the manpower needs of industry should be seen as the context for courses.

(*Kangan report*, p.xxiii)

The learners have in more recent years become all but invisible in reviews of the VET sector, with attention turning to institutional arrangements, market mechanisms, federal and state
regulation, and finance. Digital disruption means the focus must return to the individual, whose choices about how to acquire knowledge and skills now extend well beyond these structures. It is therefore refreshing to see that the recently announced Shergold Review of Senior Secondary Pathways to Work\(^3\) will seek to put the experience of students at the centre of its deliberations.

Now the task for formal VET institutions, as well as schools and universities, is to equip their students with the fundamentals they need to navigate the ‘information super highway’ (as the editors of *Kangan: 20 years on*, Peter Kearns and William Hall, called it in 1994). Students need also to be infused with the desire to keep on learning.

Here we arrive at the recurrent tension between general education and vocational training that Robin Ryan (2019), quoting Kaye Schofield, has pointed out in his survey of the landmark documents. *Kangan* saw general education as relevant to vocational education, which in turn needed to be broader than technical training and to contribute to the development of the whole person.

A decade earlier, the Martin Committee expressed the same belief:

> the introduction of liberal studies in appropriately designed courses within the diploma curriculum [in Institutes of Colleges] will add to the breadth of the student’s education, developing in particular his critical, imaginative and creative abilities. The unfolding of such qualities will help to ensure that young technologists are alive to the human and social reactions of their work.

(*Martin report*, p.182)

In 1964, just 0.7 per cent of the Australian population was enrolled in higher education; in 1974, 1.8 per cent. A decade later, it was 2.3 per cent (Abbott & Doucouliagos 2003, p.26). It is not therefore surprising that the reviews saw vocational training institutions as important pillars of all post-compulsory general education.

By 1984, the bridge between secondary schooling and subsequent employment was brought into focus by a deteriorating labour market, especially for young people\(^4\). This led to the Quality of Education Review Committee, chaired by Peter Karmel. A strong message in the *Karmel report* is the importance of a sound foundation on which to build occupational skills and the capacity to undertake roles in a democratic community and to maintain personal physical and mental health, form and nurture family relationships and use leisure time. It also defined some general competencies, all with a familiar ring to them: acquiring information; conveying information; applying logical processes; undertaking tasks as an individual; undertaking tasks as a member of a group (*Karmel report*, p.191).

Karmel was not confident that schools could deliver occupational skills. In the decades since, VET in Schools has emerged as a fixture in secondary education. According to a new paper from the Melbourne Institute, a quarter of Australian students now participate in some form of school-based VET. The researchers suggest that these vocational programs make it easier for students to find full-time and satisfying work (Moschion, Polidano & Castillo 2019). On the

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\(^4\) The unemployment rate among 15 to 19-year olds seeking full-time work in August 1984 stood at about 24 per cent, or 10 per cent of the age group (*Karmel report*, p.53). In the decade since the global financial crisis, youth (15-24 years) unemployment rates have remained above 10 per cent.
other hand, too many students are leaving school without the strong foundation in reading, writing, maths and digital skills they need to undertake post-school VET or to meet employers’ expectations about their literacy and numeracy or, indeed, to have healthy and productive lives. The OECD’s decennial Survey of Adult Skills reveals a persistent deficit in the simple reading and mathematical ability of one fifth of the Australian population (OECD 2019, p.2). As the head of the BCA, Jennifer Westacott, has said, ‘We need to fix our literacy problems’ (Westacott 2018).

Who is we? In 1991, the Finn review, which focussed on young people who had left school or were not participating in any formal education or training, answered this question by pointing to a convergence of the concepts of working and learning that would require changes in schools and TAFE. Both would need to offer general and vocational education, while industry would ‘need to take a more active role in the development and support of on-going training which is integrated with employment’.

The Finn review came up with some key employment-related ‘competencies’ 5. These were underpinned by a set of principles for a comprehensive and flexible post-compulsory curriculum that offered an appropriate mix of general and vocational education, allowed for a range of learning styles, maximised student choice and was structured in terms of clear outcomes.

Another of the most influential reports, the Mayer report, built on Finn’s key competencies. The Mayer Committee proposed seven key competencies, together with principles to provide for nationally consistent assessment and reporting on these: Collecting, analysing and organising information; Communicating ideas and information; Planning and organising activities; Working with others and in teams; Using mathematical ideas and techniques; Solving problems; Using technology.

These competencies were embraced and morphed into the employability skills that remain embedded in the ‘training packages’ that define the competencies required by different occupations and industries. They represent continuity in the type of generic skills that have always been identified as part of learning. The question still to be tackled is where and how these are best imparted. Do students need them, and the basic literacies, before they embark on a tertiary education pathway? More recently the question has become whether the notion of competencies is too narrow6. Do people need broader capabilities to navigate the new world of work and to grow as human beings?7 And what about green skills, innovation skills, entrepreneurship? Are these also generic skills?

In Moving on: report of the high level review of training packages, Schofield and McDonald (2004, p.10) emphasised that competency is a broader concept than the ability to perform workplace tasks and argued that:

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5 In the areas of language and communication; mathematics; scientific and technological understanding; cultural understanding; problem solving; and personal and interpersonal characteristics.
6 Steven Hodge offers sophisticated reflections on competency-based training, for example in The problematic role of CBT in Australian VET.
7 Leesa Wheelahan, Gavin Moodie and John Buchanan have placed Martha Nussbaum’s capability approach in the Australian context. See, for example, Implications of the human capability approach for relations between Australian vocational and higher education.
Knowledge for the new economy is less foundational or discipline-based and is rarely the product of individuals, but arises through collaborations and networks that exist within specific sites and particular contexts. This implies that current definitions and understandings of competence must be reconceptualized and broadened to encompass broader learning domains.

Such a definition answers the question about skills required to deal with new environmental challenges or the demands of the gig economy: the learner must be able to deploy knowledge and technical skills to new contexts. That leads to an epistemological question beyond the scope of this essay – what knowledge is foundational? – and suggests analytical skills are critical for coping with a rapidly changing world.

The high-level review also helped to define ‘employability’:

> Concepts of career have been radically recast as labour mobility has increased and new forms of work organisation have taken shape. As links between employer and employee weaken for many in the labour force, career development, training and learning are becoming the responsibility of the individual.

*(Moving on: report of the high level review of training packages, p.9)*

Andrew Norton’s recent work suggests individuals understand this. He has concluded that falls in the demand for formal education and training for reskilling are not the result of less requirement for training but that it is taking a different form such as online self-education or peer learning at work. Diminishing returns on the costs of formal education and training is likely another motivation.

As review after review has acknowledged, any discussion about changing skills and knowledge must take account of the implications for the skills and knowledge of the teaching workforce. How vocational educators bridge the fields of education and their occupational expertise, how they retain industry currency and whether they are equipped to manage the contemporary learner, how they receive and who funds professional development are issues that keep being raised but not adequately addressed.

Technological change is forever challenging traditional approaches to education and training. Nevertheless, some of the solutions remain the same:

- give students a strong secondary education so that they have good literacy and numeracy and the ability to keep on learning for work and life
- make vocational skills relevant to work and technology
- value the so-called ‘soft’, generic or employability skills of communication, teamwork, analysis and problem solving.

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Are things different in 2019?

Does the explosion in the availability and dissemination of information in the digital age, the rise of automation and artificial intelligence represent a real watershed in learning? Is the human brain functioning differently? Have we outsourced memory? Is learning still social?

Does the requirement for universal post-secondary tertiary education in Australia demand a new structure of educational institutions? Is the market for formal courses and qualifications reaching saturation point?

Must we face the possibility that the historical segmentation and hierarchy of educational sectors, with the separation of theory—practice/reflection—action/knowing—doing/research—teaching, no longer suits modern societies and economies? Some of these issues may be tackled by the Shergold review, whose terms of reference recognise that ‘traditional ways of thinking about pathways need to be disrupted’ (Education Council 2019, p.7).

These questions are being asked the world over. They go beyond the short-term political cycle that has dominated recent reforms in tertiary education, and in particular VET. And they are outside the expertise of the policy analysts, labour market economists and industry bodies, who have had the prominent roles in reviews.

To find answers will mean stepping out of the moulds of current policy settings, funding models and institutional structures to contemplate whether the architecture needs to be dismantled altogether, so that we have different school and tertiary duration and pathways, more lifelong learning opportunities, with quite a different role for VET than as the sector wedged between school and university, struggling for survival.

What next?

In *Kangan: 20 years on*, Peter Ellyard said, ‘the future is not something we predict but something we create’ (Kearns & Hall 1994, p.108). That creation takes time and effort. The year 2024 will be 50 years since the *Kangan report* was released. In preparation for that anniversary, let’s return our gaze to the value and purpose of education for the individual, as a family and community member as well as a worker and citizen of the nation and the world. The 20th anniversary commemoration, as well as many of the other reports in this landmark collection, the 2010 *Skills Australia discussion paper* for example, give some pointers about how to make a 50th anniversary commemoration worthwhile. The best reviews added to the evidence base by collecting and analysing data and experiences from other countries as well as our own; engaged in discussion and debate across disciplines and sectors; used a thorough consultation process to raise awareness and support for their recommendations. They took time.

Faced with a revolution in human and artificial intelligence, we need a conversation that begins outside the policy cycle and beyond the current institutional structures. The conversation must involve students and teachers without whom the system does not exist; neuroscientists and IT specialists because the way the brain learns and how we teach is changing radically; historians and economists to chart trends and crunch numbers;

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9 In this article, ‘Tip-of-the-tongue syndrome’, transactive memory, and how the Internet is making us smarter, Maria Popova offers a good discussion of ‘how are we are thinking differently’, viewed 21 November 2019, <https://www.brainpickings.org/2013/09/13/clive-thompson-smarter-than-you-think/>.
psychologists and careers advisors to help crack the pathways nut; employers and workers, who are key customers of the system; officials and politicians who need to establish limits. Together, it is they who will build a vision for how vocational learning can ride the ever-higher waves of change.
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