The Journey to Evidence-based Policy and Practice in Continuing Education and Training in Singapore

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Skills toward Employment and Productivity in Developing Countries: From Evidence to Policies

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Introduction

Evidence-based policy refers to the systematic collection of data and use of research findings to inform funding and policy making and to improve practice in public agencies. In recent years, particularly in the last five years there is a transformation taking place in workforce development in the United Kingdom, Australia, New Zealand and other western countries with strong national vocational education and training (VET) systems from a long-standing and broad commitment to skills formation and vocational education, driven strongly by industry advocacy and rhetoric, to a greater emphasis upon the rigorous collection of data and the funding of dedicated, targeted research to guide and shape more effective government policy and resource allocation within the VET sector.

This is exemplified by the formation of new agencies such as the UKCES in 2008 and Skills Australia, also established in 2008 to provide independent, research-based advice to government on long-term skills needs and vocational training policy, and the publication of several recent research based reports (Leitch, 2008; UKCES, Ambition 2020, 2010; Skills Australia Australian Workforce Futures, 2010, NZ Skills Strategy (2008) and the Australian Government Review of Higher Education (Bradley, et al., 2008) setting out long-term projections of skills needs and recommending specific strategies in the vocational and higher education sectors for the future.

While publicly funded research in vocational education and training is not new (in Australia the National Centre for Vocational Education Research (NCVER) has provided research and data collection in VET for over two decades) and, indeed the new skills research agencies have not replaced strong industry engagement in vocational education and training, they represent a changing emphasis and discipline in policy making and funding. This is also linked closely with a move to outcomes-based evaluation of training initiatives and a growing interest in research on the impact of vocational training and the efficacy of skills formation.
In Singapore public policy action to support workforce development and to develop a comprehensive Continuing Education and Training (CET) sector is relatively recent however it is noteworthy that after a late start in CET (with the formation of the Singapore Workforce Development Agency (WDA) in 2003) Singapore has moved rapidly through the ‘commitment’ and ‘development’ phases of its CET infrastructure and is now building a research capability to support and shape the future expansion and the shaping of policy in the sector. This is already having an impact on policy and practice.

This paper describes the experience Singapore has gone through in its CET journey from its inception in 2003; through the development of the national employability skills (ES) and Workforce Skills Qualification (WSQ) systems (2004 – 2008) to the formation of the Institute for Adult Learning (IAL) in 2008 and describes the current platform of research shaping, and already influencing CET policy and practice. Finally, some of the research challenges around the role of skills formation and workforce development in terms of the ‘productivity agenda’ outlined in the government’s most recent Economic Strategies Committee (ESC) report (2010) are outlined.

**From Commitment to Action: The Development of a National Continuing Education and Training System**

Singapore’s expansion and economic growth since the establishment of the Republic of Singapore in 1965 has been largely built on the foundation of a high quality primary, secondary and tertiary education system. To any visitor the quality of the educational institutions, the educational infrastructure, and the global ranking of Singapore’s universities is impressive. Educationally, the country punches above its weight.

Singapore has a three-tier post secondary education system. An Institute of Technical Education which absorbs 25% of the school leaver cohort covers trade-based certificate courses. Five polytechnics established between 1959 (Singapore Polytechnic) and 2002 (Republic Polytechnic) offer full-time diploma programmes in a wide range of vocational areas, but with an emphasis on engineering and technology related fields, to 40% of the school leaver cohort. The higher education sector comprises four public universities, led by the National University of Singapore, currently ranked 34 in the Times Higher Education rankings. The higher education sector accounts for 25% of the school leaver cohort. Engineering, science, medical research and technology-related fields dominate three of the four universities with the Singapore Management University, and two overseas higher education institutions – INSEAD and the University of Chicago providing strong foundational studies and graduate research-based programmes in economics and business management. In total over 90% of the school leaver population (MOE, 2010) have post secondary qualifications and Singapore ranks first
and second in the international ranking of science and mathematics science achievements respectively, by primary and secondary students carried out on a 4-year cycle by the Ministry of Education in New Zealand (2008).

However it was not ever thus. Figure 1 (below) shows the percentage of economically active workers aged 15 and above without post-secondary qualifications, and regarded by the Ministry of Manpower as ‘low skilled’, between 1998 and 2009. While the percentage of low skilled workers has decreased significantly over this period is recognized as a major issue for workforce development policy.

Figure 1
Percentage of Low Skilled Workers
1998-2009

Source: Ministry of Manpower, Report on Labour Force in Singapore, 2008 and 2010. These are economically active resident aged 15 years and above with secondary and below qualifications. It excludes foreign workers.

By the late 90s there were other factors emerging which drew attention to the need for other strategies, beyond formal schooling and ‘pre-employment’ post secondary education to support human capital development. The Singapore economy was changing. Figure 2 shows cumulative employment change by sector between between 1998 and 2009.
These data illustrate two phenomena which were of growing concern in terms of both workforce development and employment policy. First, the economy was in transformation to a dominantly service-based economy with manufacturing in absolute decline (between 2000 and 2004) and a rapidly expanding range of service industries, including tourism, business services and finance, healthcare, IT and telecommunications. And, manufacturing was also in transition from relatively low-value add consumer goods, clothing and footwear to new emerging and rapidly expanding sectors such as pharmaceuticals, bio-technology, medical technology, marine services, wafer fabrication, aircraft engineering and aerospace. These changes left many existing workers without jobs and needing to retrain, and the skills base of workers in the newer manufacturing and service industries inadequate.

The second observation from Figure 2 is the downturn in the economy between 2002-2004, largely caused by the post 9-11 global contraction of tourism and related sectors to which Singapore was exposed. Though resident unemployment during this time was cushioned by much heavier layoffs of foreign workers, nevertheless it topped 4%, a politically unacceptably high level by Singapore standards, by early 2004.
It was within this context that a new focus for human capital formation – continuing education and training and workforce development emerged in Singapore. The Ministry of Manpower’s *Manpower 21 Report* (1999) highlighted the need for the development of CET, including ‘employability skills’ and recommended the establishment of a new government agency to champion and drive workforce development. While programmes for adult workers to improve their skills, particularly their literacy and numeracy had existed previously (the BEST – Basic Education for Skills Training literacy programme was introduced in 1983) the later Economic Review Committee (ERC) report (2003) argued the existing programmes were not sufficiently aligned to the needs of Singaporean workers.

In June 2003 the Singapore Workforce Development Act was passed and the Singapore Workforce Development Agency (WDA) was established in September 2003. Its central role was to enhance the employability and competitiveness of the Singapore workforce through the development, funding and management of continuing education and training and through complimentary employment facilitation. Its focus was the adult workforce.

Two of the earliest initiatives of WDA, commenced in October 2003 were to put in place a national generic employability skills system and to design, develop and implement a comprehensive framework of sector (industry specific) skill standards, courses and qualifications and a framework of quality assurance for adult vocational and continuing education and training.

In both initiatives WDA undertook international studies of current generic and technical skills training systems, particularly those in Australia, the United Kingdom, Canada, New Zealand, and in the case of adult literacy skills training, the United States. Visits were also undertaken to several northern European countries to examine their adult education and training strategies.

*The Employability Skills System*

The Employability Skills System (ESS) developed for Singapore drew heavily on the *Key Skills* model in the UK, (UKCES, 2010b) the Australian Business Council Employability Skills developed in 2002 (BCA and ACCI, 2002) the Canadian Employability Skills 2000 (McLaughlin, 1992; HRDC, 1994; Curtis, 2004) and the SCANS framework in the United States (1991). The eventual model consisted of 10 employability skills groups including, importantly literacy and numeracy. The workplace literacy and numeracy competencies and assessment system was developed in collaboration with the Centre for Adult Student Assessment Systems (CASAS) in the US and adopted the CASAS assessment and proficiency framework. The remaining employability skills were arranged into a series of 8 courses (known as the Workplace Skills Series), each of which is offered at three levels linked to workforce roles – operator, supervisory, and managerial. The framework of courses in the first version of the employability skills system was implemented in
complete form from August 2005 as the Literacy Series, the Numeracy Series and the Workplace Skills Series. (For further information on the ESS system see www.wda.gov.sg)

Since its inception the employability skills system has enrolled in excess of 250,000 workers and accounts for 44% of all WDA funded CET participation. The majority of student participation in ESS has been by low skilled workers (62%). This reflects a continuing priority of the CET system, that of developing the skills and future job opportunities of low-skilled and low-wage workers. From its inception the ES system was seen as a vehicle to support this policy.

In 2010 the ES programme was extensively revised and redeveloped, in part to provide a stronger platform for the development of generic and ‘productivity’ skills of professionals, executives and managers (a major new priority for workforce development articulated in the government’s (2010) Economic Strategies Committee (ESC) report. Associated also with this review and redevelopment was a comprehensive research and evaluation study of participation, outcomes and impact of the Employability Skills (Workplace Skills) programme 2005-2010. (see further comments later in the paper).

*The Workforce Skills Qualifications System*

The framework of industry sector-specific technical occupational standards, courses and qualifications, known as the Workforce Skills Qualifications (WSQ) system was also progressively developed and implemented from October 2003. It was launched by the Singapore Minister of Manpower in October 2005.

In the development of its CET system Singapore adopted a systemic national industry-based framework of occupational competency standards and vocational qualifications closely allied to the National Vocational Qualifications (NVQ) approach in the UK and the Australian system embracing the Australian Qualifications Framework (AQF), national industry (sector-based) training packages, and the quality assurance and recognition principles in the Australian Recognition Framework. The key components, thus of the Singaporean CET system under the WSQ framework parallel closely the building-blocks of these two systems and include;

- an underpinning Anglo-European model of competency standards, competency based training (CBT) and competency-based assessment (CBA),

- strong industry engagement in the design and validation of occupational standards through sector based Industry Skills and Training Councils,

- a national workforce-skills qualifications framework comprising seven qualification levels from certificate to graduate diploma,
• a set of sectoral WSQ standards and qualifications (similar to Australian training packages) which include occupational competency standards covering all jobs within the sector, the qualifications available under the WSQ within the sector and the training pathways available

• a quality-assurance and recognition system which includes procedures and criteria for the approval of training providers, recognition of prior learning, trainer credentials and (in Singapore’s case) course accreditation,

• an underlying principal of open access to training which does not require particular academic prerequisites, and

• formal issuance of and national recognition of qualifications.

In addition to its role in the development and quality assurance of the WSQ system, WDA also is the issuing body for qualifications and funds subsidized training through two funds, the Skills Development Fund (SDF) and the Lifelong Learning Endowment fund (LLEF). WDA does not deliver training but approves and supports a network of private, and company-based Approved Training Providers (ATOs) and 48 larger CET Centres – some of which exist within polytechnics and the Institute of Technical Education. Notwithstanding this the overwhelming provision of training under the WSQ system is through private (commercial) ATOs and CET centres.

Following the initial development and implementation of the WSQ system, in 2008 the government formally approved a ten-year CET Master plan which provided for the four-fold increase in both funding and participation in the CET system, the establishment of a CET research and professional development centre, and the establishment, by 2013, of two large multi-industry CET Campuses.

By 2010 WDA had implemented 24 WSQ Industry Frameworks and the WSQ system had delivered training to over 600,000 Singaporean workers, through a network of over 500 training providers. Figures 3 sets out the range of national industry frameworks which comprise the skills formation infrastructure under the WSQ and Figure 4 shows the achievements to date in participation and learning outcomes under the WSQ system 2005 – 2010.
Figure 3
National Skills Formation Infrastructure
Industry Framework Development 2005-2010

<table>
<thead>
<tr>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employability Skills System (ESS)</td>
<td>Community and Social Services (CSS)</td>
<td>Generic Manufacturing Aerospace</td>
<td>Human Resource Leadership and People Management (LPM)</td>
<td>Wafer-Fab Precision Engineering</td>
<td>Environmental Cleaning</td>
</tr>
<tr>
<td>Retail Training</td>
<td>Finance</td>
<td></td>
<td>Creative Industries</td>
<td>Textiles and Fashion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Food &amp; Beverage (F&amp;B)</td>
<td></td>
<td>WSH Professional</td>
<td></td>
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<tr>
<td></td>
<td>InfoComm Technologies (ICT)</td>
<td></td>
<td>Floristry</td>
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<td></td>
<td>Landscape</td>
<td></td>
<td>Healthcare Support</td>
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<td></td>
<td>Precision Engineering</td>
<td></td>
<td>Trade Specific</td>
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<tr>
<td></td>
<td>Security</td>
<td></td>
<td>WSH for Marine WSQ</td>
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<tr>
<td></td>
<td>Service Excellence</td>
<td></td>
<td>Process Industries</td>
<td></td>
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<tr>
<td></td>
<td>Tourism</td>
<td></td>
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</tbody>
</table>

Source: Singapore Workforce Development Agency (WDA) Data

Figure 4
Participation and Learning Outcomes under the WSQ System
2005-2010

<table>
<thead>
<tr>
<th>Item</th>
<th>Achievements</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOAs issued</td>
<td>1,784,872</td>
</tr>
<tr>
<td>Worker participation</td>
<td>606,365</td>
</tr>
<tr>
<td>Lower skilled worker participation</td>
<td>426,829</td>
</tr>
<tr>
<td>Employability skills participation</td>
<td>250,412</td>
</tr>
<tr>
<td>Qualifications awarded</td>
<td>32,556</td>
</tr>
<tr>
<td>Accredited training organizations</td>
<td>497</td>
</tr>
<tr>
<td>CET centres</td>
<td>48</td>
</tr>
<tr>
<td>Accredited Courses</td>
<td>13,923</td>
</tr>
</tbody>
</table>

Source: Singapore Workforce Development Agency (WDA) data accurate as at December 2010
For the most part, the development and implementation of the CET system – the WSQ and ES standards, qualifications and programmes – between 2005-2008 was based on evidence drawn from comparative studies of CET systems in other western developed countries, particularly Australia and the United Kingdom. Expertise was sought from these countries (and in the case of the literacy and numeracy system, from the United States) in the development phase using project contracts, and, as noted, the underlying principles and elements of these national competency based, highly structured and regulated systems were accepted largely on the face value of their comparative success, and the existing strong educational linkages which existed between Singapore and the UK and Australia.

Singapore has never embraced the German dual model of apprenticeships, and yet was looking for a framework for workforce development, for adult vocational training which was structured, involved a high levels of industry engagement, and in which the quality of delivery, and thus the effective use of public resources could be assured. As noted earlier in the paper, many systems were reviewed and for a small but highly developed economy, the Anglo-Australian model met these requirements.

The design, development work, and the implementation of the CET system were thus largely based on a commitment from government – a recognition of the need for the development of a CET system, and a conviction that a national systemic approach was appropriate. While Singapore’s National Institute of Education (NIE) was a major international centre of educational research this is entirely focused on school education. Unlike most other developed western countries, and also South Korea and Hong Kong, Singapore did not have a centre for research on vocational education and lifelong learning. The development of the CET system was not informed by local research in this field. Research on skills formation, adult learning, the impact of training on workplace effectiveness and workforce development, work and workplace learning and the establishment of a dedicated research agency to help shape CET policy – and thus to begin the transition in CET to stronger evidenced-based strategic development and management began in 2008.

**Building Research Capability – The Establishment of the Institute for Adult Learning**

Support for a research and development centre to support adult and lifelong learning in Singapore was first articulated in the ERC report (2003) which recognized the need for a ‘centre of adult pedagogy’ and research was originally included (though not activated) in the functions of WDA. The real impetus, however, for evidenced-based policy and practice was the inclusion of proposals for an institute for adult learning and research in the 2008 CET Master Plan.
The Institute for Adult Learning was established in April 2008 with two broad functions – to support development and professionalization of the trainers and adult educators who comprised the CET community, including the delivery of high quality professional development courses and qualifications for the CET workforce, and to undertake research in adult learning and continuing education and training. It was established as a branch of the WDA itself and funding was provided for research and development, including innovation grants from the Lifelong Learning Endowment Fund. Currently the Institute has a full-time staff of around 70 and an additionally employs over 100 part-time trainers and seconded academic staff from the polytechnic sector and visiting researchers.

It has two major research priorities, these are;

- to undertake, commission and support research on adult learning and CET, including relevant skills and labour market research to improve professional practice and to inform CET policy, and

- to build research capability in CET and adult education in Singapore

A key strategy for the Institute in pursuing both these objectives has been to draw upon international researchers in the field through visiting research fellowships, and to establish overseas partnerships and memoranda of understanding with research agencies. These include the Institute of Education (IOE) at the University of London, Australia’s Griffith University and the University of South Australia, the UK Commission on Employment and Skills, the Korean Institute for Vocational Education and Training (KRIVET), the National Centre for Vocational Education Research (NCVER) in Australia, the New Zealand Centre for Educational Research, The German Federal Institute for Vocational Education Research (BIBB) and Queensland University of Technology.

The Institute undertook a wide-ranging series of consultations in early 2009 with stakeholders in the CET sector, institutional CET providers, industry, government agencies and the National Trade Union Congress (NTUC) to both engage partners in the research enterprise and to better understand the needs, particularly of policy makers, training providers and employers for research. It also sought advice from its overseas partners. The emerging strategic objectives for 2009-2012 set out in the policy are as follows;

- to establish the infrastructure at IAL to manage and support the design, conduct and dissemination of CET research
- to engage stakeholders and raise awareness of the value of research-informed policy and practice
- to build the capacity in Singapore to commission, conduct and interpret CET relevant research
- to facilitate through funding and other forms of support, the production of rigorous research which is locally relevant and of potential international significance
to form and maintain productive national and international partnerships
• to construct a database of research and systematic reviewing capability to inform policy and practice in CET
• to develop rigorous and methodologically sound approaches for tracking the outcomes of CET, in particular those associated with WDA funding, and
• to create a body of original research that addresses the key issues in learning, work and the impact of CET, guides and improves practice and engages directly with the concerns of stakeholders

(IAL, 2009, p20)

The Research Division has identified three themes to guide current research within the framework of the strategic objectives;

• **LEARNING** Understanding processes of adult learning, teaching and assessment, including workplace based learning and formal and informal learning
• **WORK** Investigating work and the workplace, the interface between work and training, changes in the labour market and workforce, work related knowledge and skill, occupational trajectories and future skills needs
• **IMPACT** Researching Evaluation and understanding the impact of training at all levels, from the national to the individual and what factors maximize the impact of training.

(IAL, ibid, p21)

The research agency model envisaged by IAL is that of a small enabling unit operating within this broad set of strategic objectives and the (cross-cutting) themes of learning, work, and impact. While relatively small, with a full-time staff of around 10-12, through collaboration and partnerships, through funding and commissioning research, and through visiting researcher arrangements it seeks to enable, facilitate and carry out research beyond its immediate capability.

A clear guiding principle, and value proposition for the research programme relates to evidence-based policy improvement. The strategy states that;

“ At the policy level, the research programme aims to provide a better foundation of knowledge on which WDA can make policy decisions, for example, in terms of funding policies and WSQ quality assurance. Research to better understand the impact of training, “what training works?” , how workers use and apply skills, what we understand by skills are some areas of potential research which can be applied to assist policy formulation” (IAL, ibid, p53)

**Current CET Research and the Emerging Policy Environment**

The IAL Research Unit has now established three centres which reflect its strategic objectives and also the emerging research priorities for CET arising from the most recent government Economic Review Committee (ERC) report (2010) which stated under its goal of “High –Skilled People, Innovative Economy, Distinctive Global City”,

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“We must make skills, innovation and productivity the basis for sustaining Singapore’s economic growth. This will also provide for inclusive growth, with broad-based increase in the incomes of our citizens” (ESC, 2010, p1) and ‘This shift to productivity-driven growth will require major new investments in the skills, expertise and innovative capabilities of our people and businesses over the next decade’ (ibid, p3).

The three centres are the Centre for Research in Learning, the Centre for Skills Performance and Productivity Research and the Centre for Evaluation and Innovation Research.

Figure 5 below sets out the recent and current research projects being undertaken within the scope of each of the three research centres.

Figure 5

Recent and Current Research Projects

It should be noted that while the IAL as a publicly funded research agency closely linked with the Singapore Workforce Development Agency and clearly has a strong brief to conduct research to advise CET policy, (and in fact some research projects are directly commissioned by the WDA), it also sees a wider role for its research programme to improve adult learning and to contribute to the international body of scholarship in vocational and continuing education. To this extent it is currently seeking and developing international research collaborations around issues which, while pertinent to Singapore have a more global significance. And it also is developing a high level capability, not just to conduct research but also to draw upon and assimilate global research findings relevant to policy and practice in Singapore.
Current research projects are providing evidence which is reshaping policy and practice in CET in Singapore in the following areas;

- The impact and outcomes of generic, employability skills training
- The effects of training initiatives on lower-skilled and low-wage workers
- The extent and quality of workplace-based learning in CET in Singapore
- Contextualization in workforce training
- Flexibility and movement across the CET- higher education boundary
- What skills are utilized in work.
- The Impact of skills formation and training on workforce and industry productivity.

While specific research findings in much of the most recent IAL work have not yet been published, in the following overview a brief indication is provided of the ways in which emerging research is providing new insights which are beginning to reshape CET policy, funding, and the directions for the future development of the sector.

The Impact and Outcomes of Generic, Employability Skills Training

While much has been written about generic and employability skills and these continue to be of strong national interest in building workforce capability (ACER study by Curtis and McKenzie, 2001; SCANS, 1991; UK Learning and Skills Network by Martin et al, 2008; UKCES, 2010; OECD, 2004), there is conjecture about the effectiveness and impact of such programmes, (Hayward and Fernandez, 2004; Turner, 2002; Cornford 2005) and little evidence that employability skills training improves worker wages and job advancement (see OECD 2004; UKCES, 2010, Ang et al, 2006, Toh et al, 2008).

As noted earlier in this paper, a major component of Singapore’s CET investment 2004-2010 has been the implementation of an employability skills programme and a rationale for the programme and one of its stipulated outcome measures was worker wage improvement and advancement. In a 2010-2011 evaluation of the impact and outcomes of the ES programme Willmott (2011) reviewed the international findings on generic skills programmes and gathered Singaporean data through an employers survey on the outcomes of the programme. The data confirmed other research that tangible improvements in workers’ wages and advancement were minimal, however there were other positive outcomes of employability skills training on workplace effectiveness, morale and motivation and improved service culture.

The results of the study have changed the policy on evaluation and the outcomes model and will shape the future development of employability skills programme.
The Effect of Training Initiatives on Lower Skilled Workers

An important policy goal of the CET system in general and the employability skills programme in particular is to support social and economic mobility of Singapore’s low wage and low-skilled workers. The reduction in the ranks of Singapore’s low-skilled workers through skills upgrading was a major focus of the ES programme. Demographic studies suggest that while the proportion of lower-skilled workers in Singapore has declined (from 62% in 1998 to 48% in 2009) (Ministry of Manpower, 2010) this is accounted for almost entirely through demographic factors – the entry between 1998 and 2009 of nearly 500,000 highly skilled new entrants to the labour market. The research concludes that far more targeted programmes combining mainly job-specific technical skills with some generic skills, mainly literacy, numeracy, communication and IT skills aligned to the skill requirements of occupations above the low-wage threshold where specific vacancies exist will be more effective.

Workplace Training and Contextualization in CET in Singapore

Two research projects conducted by IAL (Bound, 2011; Willmott, 2011) have drawn attention to the highly classroom-centric nature of CET in Singapore and the very limited level of contextualization of training. While the latter is restrained to a significant extent by the current WDA course accreditation and assessment requirements it also reflects limited capacity in the WSQ providers to contextualize training and relatively low levels of employer engagement.

There is substantial literature on the effectiveness of workplace based training (Bound, 2007; Billett, 2004) and contextualization, particularly on training transfer (Cheng and Ho, 1998; Hager et al, 1997; Hawke, 2004, Cornford, 1996). Willmott (2011) found most employers sought contextualized training, especially training in the workplace and that this was a major contributing factor inhibiting transfer of skills into the workplace. Bound (2011) found that most workers ranked workplace learning integrated with the job as most effective, structured classroom based vocation training having one of the weakest impacts on learning.

The findings emerging from the research around contextualization have been taken up at the policy level to review the current restrictions placed upon contextualization in WSQ courses and in new funding arrangements with providers for generic skills training. These will in the future require higher levels of contextualization and greater engagement between training providers and employers. The research on workplace learning is still in progress and comprises a large programme. It has the potential to significantly transform the nature of CET training in the future as the impact of workplace-based strategies become better understood.
Flexibility and Movement between the CET – Higher Education Boundary

There is heightened interest in the UK, Australia and New Zealand on the relationship between CET and Higher Education. In these systems, despite the establishment of national qualifications frameworks which appear to integrate in seamless configurations the qualifications in the schools, VET, and higher education sectors, the reality is of distinctive vocational and higher education sectors separated by differences in status, educational philosophy and ideology, purpose, and with significant barriers to movement of students between them. The recent Review of Higher Education in Australia (Bradley, et al, 2008) and the UKCES (2010b) review paper on articulation and recognition between further and higher education in the United Kingdom having pointed to the imperative for more connected, integrated systems to improve access and movement between the Vet and higher education sectors, to enhance the effectiveness of educational funding and to achieve targets set for higher education participation and skills formation. In NZ the National Qualifications Framework was changed in 2010 (see Strathdee, 2010) to facilitate greater recognition and access between the sectors.

This is also an issue in Singapore which has distinctly separate CET, and PET (pre-employment training) sectors, the later embracing higher education. The ESC (ibid) report and the recently established Productivity and CET Council has called for improved articulation. In 2010 IAL undertook a first research project to scope the patterns of movement, issues and differences in learning styles between the CET and PET sectors. (Harris et al, 2010)

What Skills are Utilized in Work

Currently IAL is undertaking a large empirical study under the Direction of Professor Johnny Sung (IAL Principal Research Fellow) to establish a Singapore Broad Skills Index (BSI) paralleling similar work undertaken in the UK (Felstead et al, 2007). The intention is to build a picture in Singapore across a comprehensive range of sectors of what skills are utilized in work, in different occupations. The study involves over 3000 worker respondents to determine worker perceptions of the skills needed for their job, the level of training required and the extent to which on-going skills upgrading is required to maintain the skills of their work. This study will have major policy implications when completed in terms of the future development and delivery of both the WSQ and Employability skills systems and will for the first time provide a comparative measure of skills utilization in Singapore.

The Impact of Skills Formation and Training on Workplace and Industry Productivity

As noted earlier a major current policy focus for national economic development in Singapore is focused on the concept of ‘capability driven growth’, economic growth driven by improved productivity. This was the central message in the 2010 Economic Review Committee (ERC)
Report. It argued the need in Singapore for industry to move away from expansion based upon increasing levels of foreign manpower, to growth based on productivity improvement. The report set a benchmark to “achieve higher productivity growth of 2 to 3 percent per year...” (ESC, 2010, p14) Amongst the strategies proposed was the development of the CET system including;

“providing more opportunities and multiple skills-based progression pathways...further build up a first class CET system...provide stronger linkages and clarity between our academic and skills qualifications...(and) ...reach out to more PMETs (Professionals, Managers, Executives, and Technicians) We should develop “T-shaped” competencies – possessing both deep skills in their area of expertise and broad knowledge of horizontal skills (eg business operations, project management, HR, or finance and management” (ESC, ibid, p 16)

The new “productivity agenda” in Singapore is mirrored in similar aspirational reports recently published in the UK (Leitch, 2006, UKCES, 2010) and Australia (Skills Australia, 2010) and in all three countries significant responsibility is directed to the vocational or CET sectors to generate skills formation to improve productivity. Herein lies a major issue for vocational education research, and in the Singapore context, for the IAL. Stated succinctly is is “How much do we know about how skills formation contributes to productivity growth?” “What skills, in which sectors, in what contexts?” And when we look across different sectors, from manufacturing, to education, health, tourism, aerospace and bio-technology, for example, “What do we mean by productivity improvement in different sectors and in what circumstances is it achieved?”

When the current rhetoric and research on workforce development and productivity is examined there appear to be several implicit theories of skills and productivity, these include;

- **The Leadership (T-skills) Model** Productivity is facilitated by enhanced organizational leadership, especially by leaders who combine deep technical skills in their field with ‘cross-cutting’, generic skills.

- **The High Performance Workplace Model** (Sung and Ashton, 2005) Higher workplace performance and thus productivity occurs when workplaces display effective teams, high levels of motivation and reward, more autonomous, responsive and innovative decisions, high quality information, including financial data and effective communication in ‘high-performance’ organic systems.

- **The Return on Investment Model** (Phillips, J., 2003) Investment in training needs to be treated like any other investment and specific returns measured against investment value. Specific models and analyses can be applied to enhance the ‘ROI’ value of training.

- **Skills Efficacy and Transfer Model** Skills formation is not effective in improving productivity unless a good fit of skills to work is achieved, skills imbalances are removed across the economy (skills shortages and regional disparities) and skills learnt are effectively recognized by employers, transferred, and utilized at work

- **The Aggregate Skills Model** Net increases in skills, and higher investment in skills training will have an aggregate flow-on to improved productivity.
An important research focus for IAL as it moves to embrace the emerging policy agenda of productivity driven growth contained in the ESC Report and the current work of Singapore’s Productivity and CET Council will be to build a stronger evidence base on the relationship between various training and skills development interventions and their impact upon productivity as it is understood and quantified in different economic sectors. This work is yet to begin. It is an area in which the shared imperative in other developed economies for productivity growth through skills formation suggests a potential for collaboration with other research agencies.

Concluding Comments

This paper has traced the development since 2003 of Singapore’s emergent CET or adult vocational education and training system, its current levels of participation and scope in workforce development and the movement towards stronger evidence-based policy and practice through the development of a CET research capability. Already the work being carried out by IAL is having an impact on policy. The IAL also has also recently initiated an innovation grants programme to support innovative practice and is moving towards a new and comprehensive evaluation framework for the whole CET system. CET has reached this point after eight years of total system development. Quite quickly in fact in comparison to other nation VET systems. But the question could be asked, should it have developed a research capability sooner, perhaps beginning with research capability development before investing in CET infrastructure?

In the view of this paper, the strategy used in Singapore was correct. Commitment and conviction from government, industry and unions (the ‘tripartite partners’) to develop a new adult vocational training system was essential, and moving quickly, principally to gain and build industry support, and to put in place accessible programmes, especially in sectors which did not have a skilling system, and to provide subsidized funding to achieve ‘mass roll-out’ was critical for this new system to achieve the gravitas and recognition needed to move forward and build credibility. It is now moving towards maturity though building a strong evidence framework to shape future practice and policy so that the infrastructure now in place can be used and further developed most effectively to meet the future needs of the country.
References


