A NEW APPROACH TO ENGAGING YOUNG AUSTRALIANS IN SKILLED CAREERS

REPORT BY THE PARK FAMILY CHURCHILL FELLOW 2012, NICHOLAS M WYMAN

TO

THE WINSTON CHURCHILL MEMORIAL TRUST OF AUSTRALIA
GPO BOX 1536 CANBERRA ACT

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Signed ____________________________ and dated 31 January 2014.

Nicholas M Wyman
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INTRODUCTION

Summary and Acknowledgements

Australia, like many parts of Europe and the United States faces a significant challenge with students not successfully transitioning from school to the workplace. This is evidenced by extremely high youth unemployment rates, particularly amongst 15-19 year olds. This fellowship has researched new approaches to engage young Australians in skilled careers.

I would firstly like to acknowledge The Winston Churchill Memorial Trust of Australia and particularly The Park Family for awarding this fellowship to me and giving me the opportunity to undertake this important piece of research. I would also like to thank the Institute for Workplace Skills and Innovation for supporting me to undertake the fellowship, particularly the Chairman, Mr Frederick Maddern OBE as well as the Directors James Lawrence, Sophie Ramsey, Chris Ingram, and Rob Gell.

Also to be acknowledged is Mr John Richardson, Director of the Victoria State Office, Department of Foreign Affairs and Trade; Mr Michael Schwager, Minister-Counsellor (Education, Science and Technology) Embassy of Australia, Washington DC; Mr Mark Unwin, Senior Advisor, Australian Delegation to the OECD, Embassy of Australia, Paris; Ms Janine Pitt, The Minister-Counsellor (Education and Employment), Australian Delegation to the OECD, Embassy of Australia, Paris; Mr Mark Keese, Head of Employment Analysis and Policy Division, Directorate for Employment, Labour and Social Affairs; Professor Felix Rauner, ITB, University of Bremen; Mr Charles Parker, Chief Executive Officer, The Baker Dearing Educational Trust and Mr Gary Workman, Executive Director, Group Training Association of Victoria.

Final acknowledgements go to all the people from companies and educational institutions, as well as students who did not wish to be specifically identified, who took time out of their busy days to meet with me and share their knowledge.
EXECUTIVE SUMMARY

Nicholas Wyman
Chief Executive Officer
Institute for Workplace Skills and Innovation
440 William Street, West Melbourne Victoria 3003

New approaches to engage young Australians in skilled careers

Regrettably, many young people in our society find themselves without the ‘real world’ skills they need to obtain and keep employment. The Park Family Churchill Fellowship allowed me to undertake an in depth field based review of six countries; Australia, France, United Kingdom, Netherlands, Germany and the United States, comparing and contrasting how they approach 4 core themes:

- School to work transition
- Youth unemployment
- Social status of skilled and vocational careers
- Engage business and industry in solutions to solve the skills gap

This research has assisted in the identification of several key recommendations. The primary recommendation and outcome; applying a new and innovative approach to education has led to a roundtable meeting on the 17th December 2013 in Melbourne Australia giving business, Government and other key stakeholders an opportunity to participate in and join the conversation. Participants actively contributed to possible solutions to address this challenge of improving school to career transitions. I had the opportunity to address the group, specifically on my research findings.

Many countries have looked at traditional skills building programs such as apprenticeships to address the school to work transition. Many of these programs have emanated from Europe, particularly the German model which has been recognised for many years as the blue-ribbon standard. As I discovered however, we now know a number of those European countries have gone through significant economic transition placing the ‘traditional’ apprenticeship model under pressure. In Germany (and countries like Switzerland and Australia), Apprenticeships are still held in high regard however as I saw, have now started to evolve into what is now known as ‘Modern’ apprenticeships. It goes to reason that with innovations in technology and productivity, workers entry level skills need to be aligned to these changes and the skills programs updated accordingly. The countries that are adopting the modernisation of apprenticeships are also able to tackle some of the core themes such as social status of skilled careers (apprenticeships) by defining a clear track that enables people to see that an apprenticeship is not the end of a persons skills development, in fact the complete opposite. My second recommendation is a review of Australian Apprenticeships, specifically looking toward more closely aligning to the needs of business and industry in Australia now and in the future.
PROGRAMME

Compare and Contrast Youth Engagement in five countries

Shift between, and cover:

- School to work transition
- First six months of youth unemployment or disengagement
- Social status of apprenticeships and skilled careers
- Engagement of commerce, industry and employers

by comparing and contrasting mid-range and low-range youth unemployment countries with Australia and USA.

% Youth unemployment rates in EU countries (November 2011)

<table>
<thead>
<tr>
<th>Country</th>
<th>Rate</th>
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<tbody>
<tr>
<td>Spain</td>
<td>49.6%</td>
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<tr>
<td>Greece</td>
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<td>Estonia &amp; Belgium</td>
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<td>Finland &amp; Czech</td>
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<tr>
<td>Germany</td>
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</tr>
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</table>

Compare and Contrast: Mid-range

- France
  - Career Pathways, Counselling and Guidance
  - Literacy and Numeracy Influences
  - Importance of the Baccalauréat

- UK
  - Regional differences: Services and Outcomes
  - Career Program ‘Connexions’
  - The Apprenticeships system

- USA
  - State differences: Services and Outcomes
  - Declining Registered Apprenticeships system
  - Industry innovations (focus on Manufacturing revival)

Compare and Contrast: Low-range

- Netherlands
  - Impact of a 24 hour working week
  - ‘No Risk’ employer policy with wage top up
  - Mandatory work and study

- Germany
  - Career entry support (final 2 years school)
  - Catch up qualifications
  - Programs around engagement

In both Netherlands and Germany, follow developments in their ‘dual system’ of (VET) Vocational Education and Training.
MAIN BODY

Global perspective

All around the world people are talking about the skills crisis and what companies can do to become more competitive. All the countries I visited had challenges with youth unemployment. If we look specifically to Europe, according to the European Commission’s recent statistics over 7.5 million 15-24 year olds are neither in work, education or training. During the fellowship, I was able to see first hand the impact of economic change, particularly on traditional education systems, from 2009 onwards. This period is described in the Global context as ‘The Great Recession’ or ‘The Global Recession’. In Australia, this period was known as the Global Financial Crisis (GFC). Prior to this period, European and American education systems were built around long standing relationships with industries. The reality is many of those industries, particularly during this period have undergone significant change.

In Australia, as at December 2013, the Australian unemployment rate sat at 5.8%. The Teenage full time unemployment rate for 15-19 year olds was 5 times this rate at 25%. The table below shows examples of particular regions and states within Australia and how this rate varies from state to state.

The unemployment rate can often be a misleading indicator of the true level of unemployment. A more appropriate rate to look at is the N.E.E.T rate. Not in Education, Employment or Training (NEET).
Australian Teenage full time unemployment rate for 15-19 year olds December 2013 – Labor Force Data

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<thead>
<tr>
<th>State</th>
<th>Region</th>
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<td></td>
<td>North West Melbourne</td>
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<td></td>
<td></td>
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<td>40.2%</td>
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<td>New South Wales</td>
<td>Regional NSW</td>
<td>Wollongong</td>
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<tr>
<td></td>
<td></td>
<td>Illawarra excluding Wollongong</td>
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<tr>
<td>Sydney</td>
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<td></td>
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<td>Canterbury Bankstown</td>
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<td></td>
<td>Lower Northern Sydney</td>
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</tr>
<tr>
<td>Queensland</td>
<td>Regional Qld</td>
<td>Wide Bay - Burnett</td>
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<td></td>
<td></td>
<td>Far North Queensland</td>
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<tr>
<td></td>
<td></td>
<td>Gold Coast</td>
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<tr>
<td>Brisbane</td>
<td></td>
<td>Brisbane</td>
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<td></td>
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<td>Ipswich City</td>
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<tr>
<td></td>
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<td>Brisbane City Outer Ring</td>
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<td>South &amp; Eastern BSD Balance</td>
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<td>South Australia</td>
<td>Adelaide</td>
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<td>North Adelaide</td>
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<td>Tasmania</td>
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<td>Northern</td>
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<td></td>
<td>Greater Hobart - Southern</td>
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<tr>
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<td>19.4%</td>
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<tr>
<td>ACT</td>
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<td>28.1%</td>
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The Australian Situation

In Australia we are seeing evidence of a ‘lost generation’—a large number of young people who are neither in school nor in the work force. Many of these people find themselves in this situation because of family dysfunction, bad experiences or not engaging at school (often related to the curriculum), poor or no career advice or an overall lack of purposeful goals. It’s a complicated problem that as a nation Australia must address. Many of these individuals, whom I met with tell me they “get by with government support,” which some refer to as their monthly “paychecks.” Or worse, as one young man put it to me it’s ‘my entitlement’.

While many of their peers are gaining workplace experience and stepping up to higher and new responsibilities, many do not participate. Every month that this group remain disengaged and on government assistance, the matters are compounded with the probability they will struggle to get into a fulltime, regular employment pathway.

For this group who have failed to make the transition, the Government needs to continue to actively work within the current systems, to help these people to move off welfare and into work.

What the fellowship highlighted to me was the need to look forward, to those who are coming through the pipeline. We need to understand the drivers and circumstance in our current education systems that are enabling these people to leave secondary school with little or no direction, or basic skills such as reading, writing and the ability to work with others. These foundation skills are critical for all Australians, regardless of their circumstance. These are the skills today’s employers hold in high regard.

It is critical to look specifically to our secondary school system and ascertain why so many young Australians are becoming disengaged in such alarming numbers.

United Kingdom

In the UK, I met many employers small and large as well as agencies engaged in the Vocational Education and Training Sector. Overall, I observed the pressure being placed on the vocational system to deliver the skilled workers required for the economic projections. Particularly as I travelled to regional areas, I feel these projections appear somewhat optimistic.

It should be noted, there is strong government financial support for vocational training and such programs. There is a strong political commitment to social inclusion which is demonstrated through the level of incentives to employers, to employ youth at risk of not making the transition from school to work.

I was able to ascertain that UK Government policy is committed to increasing the number of places for young people in Vocational Education and Training. It was also noted that in the UK, there had been many promising programs such as one called ‘Connexions’. This program provided career advice and support for young people aged between 14-19 years. These career centres were located nationally both in metropolitan and regional areas.

From what I was able to ascertain from talking to people who had been involved with the scheme, it had great promise however the government decided not to pursue funding in this area. The network is all but disbanded. I was able to take away an interesting observation from this seemingly successful program’s demise.

Observation: It is important with today’s political cycles, that programs that are funded by governments are properly researched and if supported are maintained for a set period regardless of political cycles.
There is a resurgence of Apprenticeship programs in the UK. Anyone person 16 years old and above and living in England is able to apply for an apprenticeship as long as they are not already enrolled in full time study. Like Australia, there are different entry requirements depending on the Apprenticeship and the industry sector. People who have completed other qualifications can start apprenticeships however if they are a student who has a prior qualification in higher education for instance, they will not be eligible for Government Funding. I was pleased to see the Government people I spoke to referring to Apprentices pay as a ‘training wage’. This is important as we are now seeing in Australia, challenges with young adults wages doubling overnight when the person turns 21. This is seen by many employers as a barrier and subsequently they do not even get to interview stage. This is a challenge that Australia will have to grapple with. Wages that many employers, particularly smaller ones find prohibitive for financial reasons. The challenge for the UK however, particularly from my visits in regional England highlighted that there are few jobs that remain in manufacturing. Even if the UK was to focus on modern manufacturing practices and attempt to re build this sector, it may take many years. This will therefore limit opportunities for young people moving forward.

The 1997 Education Act required that between the ages of 14 and 16 all school pupils should follow a programme of careers education and be provided with up to date and relevant materials. However, employers and other apprenticeship providers subsequently found that many schools either did not allow them to present information on apprenticeships to pupils or made access very difficult. In 2005, two thirds of those aged 14-15 (Year 10) reported that they had never heard of apprenticeships when in school. This was interesting and goes directly to careers advice and students being given a full variety of informed options whilst still at school. I was interested to see how the Government has both branded and promoted Apprenticeships as a powerful tool for engaging people, in transition. One such initiative is the Governments promotion of the ‘Roll of Honour’. The Roll of Honour showcases businesses who are committed to Apprenticeships. There are hundreds of businesses on the Roll of Honour already as they recognise the business benefits they gain from employing apprentices. Employers are also able to receive an ‘Employer Badge’. This can be displayed by businesses on their websites, stationery and marketing materials, to highlight their commitment to Apprenticeships. If used, advice to National Apprenticeship Service results in automatic Roll of Honour citation. There is also an Employer Certificate, to help customers know which companies offer Apprenticeships. Apprenticeship Employer Certificate’s are available to employers who employ apprentices.

One of the more interesting meetings and initiatives I saw in the UK was with Charles Parker, Chief Executive Officer of the University Technical Colleges (UTC). Mr Parker was a wealth of knowledge and applied a very commercial approach to addressing the issues of transition and skills. The UTC’s offer 14-18 year olds technically orientated study that combines written work with hands on skills that is sponsored by a university at university campuses. 60% of class time is spent on general education and bridging core studies and 40% on technical studies. This program gives the student the opportunity to progress into employment or higher education. Local and national employers are involved in the design and updating of the curriculum so that the students are coming out with the relevant skills that employers are looking for.
The specialised subjects of the UTC’s include engineering, product design, health sciences, construction, and land and environmental services plus basic business skills and the use of ICT. Students are selected from wide geographical areas and are not judged on their past performance when being considered for enrolment. UTCs will be offering a range of A levels and level 3 technical qualifications and most students will leave with a variety of these (e.g. BTECS and City & Guilds). UTCs will make sure that every leaver has a GCSE in English and in maths.

This model has proven to be very successful in the UK with 40+ colleges. The buildings are designed to reflect the work place rather than a normal school or college building. The choices of equipment and ICT design are driven by the curriculum and teaching strategies, as well as reflecting the workplace.

At the time of writing, some exciting developments regarding new apprenticeships were emerging in Northern Ireland. It is worth watching the Government’s revival of skills and apprenticeships closely in this region. I believe it to have great promise.

Germany

As Germany is seen as the gold standard in vocational education and training (particularly in apprenticeships), I dedicated a large amount of my time to understanding how things are in Germany, as some recent media suggests that a larger number of apprentices are dropping out of programs. The fact is the rate is still a 75% completion rate, (on average 25% greater than Australia’s average) however I wanted to understand the factors for this. One of the first things I ascertained from a doctoral student at the university of Berlin is that the number of new training contracts signed was at the lowest in nearly 10 years. He described the reason for this to me as students having misconceptions about what is involved in apprenticeships. This was all surprising to me as the majority of media we see and hear in Australia and even in the US is that the German apprenticeship model is leading the world.

In Germany I learned from both the public and private sector that vocational training has long been a respected and desirable career path and two of every three German secondary school graduates begin vocational education and training with 80 percent of them completing their programs. Again, the solution to school to work transition pointed toward apprenticeships. Not surprisingly, Germany’s youth unemployment levels are very low, compared to Australia (and many other regions of Europe like Spain and Greece where the rate has surpassed 50% in some regions). In contrast vocational education in Germany has been characterized by the dual system of close cooperation between private enterprises which pay, employ and train apprentices and Government-funded public vocational schools.

Train then place vocational courses have been evolving in most industries in response to the availability of young people waiting to start an apprenticeship. School students in their final year of school are expected to decide on a future training occupation or course of full-time study. Schools are responsible for incorporating elements of vocational orientation into the curriculum.

The German apprenticeship system is certainly overall most successful however as many countries have found (such as some in South East Asia) is hard to duplicate and replicate in other regions. The success of their program is due to both the cultural acceptance of apprenticeships and the high esteem in which trades are held.
What I took from the German model is its acceptance of the mentoring system and its benefits in retaining apprentices for the full term of their qualification. In Germany, these mentors are the managers or supervisors who themselves have been apprentices.

Germany benefits from having industry and business support of apprenticeships which is crucial to a successful program. Many businesses acknowledge that apprenticeships are vital to the ongoing succession planning of their businesses and understand the need to produce the next generation that have skills handed down from the previous.

Modern industry is the path that both Germany and Switzerland followed that has kept their economies buoyant. I did ask Pro Rauner about what I see as the explosion of bachelor and sub bachelor study courses and degrees that are being introduced around the world, many taking over the functions of traditional vocational training. If you look in the detail of these bachelor programs, the majority have little to do with higher education. Dr Rauner described this to me as vocationalism in higher education. He said to me there are literally 1,000’s of bachelor degrees on offer. To me it seemed like a large number of Universities are no longer Universities in reality they are delivering low level vocational training. I must state here that I have attended University, post my trade qualification. I am not anti University at all, but do believe that a distinction needs to be made at where vocational stops and university academic starts. However as I have seen with the UTC model these types of programs can work when done correctly.

So what would the world’s best education system look like? Dr Rauner believes that policy makers should look at a system with a dual architecture. ‘Skills programs, such as an apprenticeship become attractive if participants know they continue in higher education. Specifically, an apprentice should be able to progress to a dual bachelor program.’ Dr Rauner said it would have architecture of parallel tracks. You need a strong track on scientific related knowledge at excellent Universities; you need a parallel track for professionals becoming entrepreneurs. Combine work experience with reflective work experience.

Switzerland made a decision with polytechnics and bachelor degrees. The only way to become a student at a polytechnic in Switzerland is to have apprenticeship training plus an apprenticeship related ‘A’ level degree. Apprenticeship training in Germany, Australia and Switzerland is not just learning skills.
You are also learning deep work process knowledge. In Switzerland, everyone gets the chance if they want to get into higher education. It’s a condition to have an apprenticeship. The prestige of getting into an apprenticeship is very high. Industry is very keen to support it because they know these people are really good quality. Switzerland follows the parallel track. Switzerland’s economy is very strong and one of the key reasons, says Dr Rauner, is the parallel track.

Dr Rauner reflected on the regions of Germany that are close to the high levels of economic growth in Switzerland. Baden-Württemberg has a very low unemployment rate, yet is one of the wealthiest regions in Europe. To go to a dual bachelor program, you have to have a job at a company in the region like Bosch, Porsche or Daimler AG or in one of the optical businesses.

German Traditional Apprenticeship (Learning by Doing) Vs Innovative Apprenticeship:

I ascertained that if modern manufacturing is to survive, it must be supported by modern or innovative apprenticeships. The weaknesses of just learning by doing in a traditional apprenticeship as opposed to the advantages on innovative apprenticeships are as follows: Firstly learning by doing is usually in low potential work based training. From an occupation perspective, learning by doing is often fragmented, specialized and company orientated. An innovative apprenticeship on the other hand focuses between 250-300 core occupations and is dynamic in its design. The learning by doing approach has a narrow depth of knowledge whereas an innovative apprenticeship has deep work process knowledge. The final key difference is that a traditional learning by doing apprenticeship most likely displays an isolated training approach. One skill, one job.

This risk here of course is that industry and technology evolve and the persons skills become redundant. An innovative apprenticeship is a first step in the dual education and training track and has the potential to progress to dual master programs. This of course has also to do with attracting people to an apprenticeship. A traditional apprenticeship often has stigmatisation a perception of low wages, low vocational identity and subsequent commitment. On the other hand, a modern innovative apprenticeship offers a highly attractive occupational pathway with high potential.

Netherlands

I found that in the Netherlands much like in Australia they have a formal structured system for vocational education that includes both school and work based learning. It was explained to me that the system has had to constantly adapt to changes experienced in skills and jobs demands as well as an overall increase in the number of students wanting to study. The system has undergone significant changes recently and therefore it was difficult to identify specific transferable opportunities. I did ascertain that the apprenticeship system is formally integrated into the education system at all levels. Another significant change is the way traditional schools are changing in design from the traditional ‘industrial training centres’ to more ‘innovative learning centres’ as it was put to me. Again here, I see evidence that secondary schooling education design is critical in a seamless flow from school to work or school to further study.
At the age of 12 students enter secondary education; they must select one of three pathways:

- Pre university education focusing on academic subjects
- Pre university education focusing on applied/vocational subjects
- Preparatory vocational secondary education.

It felt fairly ominous as it was put to me that the decision these young people make at this time will follow them through the next 6-8 years going as far to say what career they may select. I feel that at 12 it may be too young for such decisions and it takes me to a conversation I had with a post doctoral student in Berlin who said he undertook a similar rigid track. In his case, he felt it did not give him the full options available to select from and as long as he can remember, he was on a certain and fixed trajectory.

I was interested to learn about school based training where students typically spend four days a week at a regional education and training centres and one day at an employer’s on a work placement. Students are eligible to receive financial assistance for their tuition and can also receive a small stipend or payment for their work placement from their employer.

Work based training students typically spend four days a week at work placement and one day at a regional education and training centres. They have the status of an apprentice, in that they have an employment contract with their employer and receive a minimum wage. In sectors of demand some employers even attract students by offering additional pay. It is the student’s responsibility to secure their work based placement which I found interesting. Around 80 percent of students are engaged in the school based system.

**France**

I met with educators and business owners in France. Again, there was a strong sense that issues surrounding school to work transition needed to be formalised and Apprenticeship came up often as a solution. In France however, there is still a stigma to many ‘traditional trades’. The key lesson I learnt in France was from a Harvard colleague who works in professional consultancy. I found it generally hard to extract information, I found people often lacked specific detail in broad terms. I did take the opportunity to attend meetings at the OECD (Organisation for Economic Co-operation and Development) which is headquartered in Paris. In 2007, I had the opportunity to participate in a review titled “Learning for Jobs OECD Reviews of Vocational Education and Training Australia”. Simon Field together with Kathrin Hoeckel, Troy R. Justesen and Moonhee Kim who spent extended time in Australia. I reconnected with Simon Field to discuss the several matters, specifically his latest report ‘Skills beyond School’. I was particularly interested in Simons work on this report as I had heard him on Boston public radio some months before my travels with Stanley Litow from IBM talking about a new innovation in education. It would be this connection that led me to look further into the IBM School to work innovation that months later led to the Australian roundtable.

Simons report gives the thumbs up to the US for being innovative and dynamic regarding policy formation and makes mention of the calibre of many training institutions. On the other side of the coin however, there are challenges.
We also had an interesting conversation about the quality of education for the individual, at the core of what a person should consider when considering education of any kind is the quality of training offered. In the context of transition, I know that any programs or initiatives recommended need to be robust and have a strong quality framework. There is no question that regarding apprenticeships there is regulation. In fact it could be said there is so much regulation (and red tape) some employers find it all to complex. This would become a further consideration when making my recommendations. I had an interesting discussion about how Governments should follow their education dollars invested in training and the best way to do so. I understood the best way you can do this is through quality assurance.

We finished talking at length about the more positive side of US education, specifically for people considering skilled careers. The US has outstanding open access community colleges, with relatively low fees. As we have discussed however, many have significant issues with dropouts. This was something I would look forward to understanding about the P-TECH model. How would they address this critical issue, at the core of my 4 core themes?

United States

I would like to thank the management and staff at The Winston Churchill Memorial Trust for their support in an itinerary change once the importance of the US based P-TECH model became. As it turned out, this was critical to one of the two key recommendations. My time in the United States was almost entirely dedicated to learning about an initiative called P-TECH. I wanted to see first hand how the experiment with new approaches to reinvent high school (and career transition) was growing in interest so rapidly. In New York City, IBM and the city’s school district, in partnership with City University of New York, launched P-TECH (Pathways in Technology Early College High School). Founded in 2011, P-TECH’s grade 9-14 program provides an integrated high school and 2-year college curriculum with a heavy focus on science, technology, engineering and maths, while also teaching workplace skills such as teamwork and problem solving.

Having identified a common theme in the countries visited relating to a stigma around vocational training, the P-TECH’s innovative approach to education in the United States stood out. I find myself in the fortunate position that one of the two recommendations has already sparked interest in Australia.
On Returning to Australia: School to Career Roundtable Melbourne 17th December 2013

On my return from the fellowship, IBM, Skilling Australia Foundation, NICTA and Group X hosted a School to Career Transition Round Table in Australia on the 17 December that gave business, Government and other key stakeholders an opportunity to join the conversation and come up with possible solutions to address the challenge of improving school to career transitions in Australia.

The Roundtable was opened by The Senator the Hon. Scott Ryan and key speakers were Mr Stanley Litow, founder of P-TECH and Vice President of Corporate Citizenship & Corporate Affairs IBM and President, IBM International Foundation; Mr Andrew Stevens, Managing Director IBM Australia/New Zealand and Myself. Participants heard how about the problem Australia faces and how the time was right to investigate a real opportunity to look at a fresh approach to school to work transitions, career pathways and youth engagement. The group of 27 representing industry, government(s) and the education sector participated in the discussion and identified opportunities. To focus the conversation, participants discussed and considered the following questions.

- Based on what you’ve heard about P-TECH and the US response to the skills crisis, what seems most relevant to the situation in Australia?
- What specific factors need to be considered in developing a School to Career Transition model for education in Australia that meets the skills gap in the ITC and other industries?
- How can key stakeholders in Australia work together to develop a new model in terms of resources, policy and the connection between the private sector, public sector, secondary schools and higher education to better prepare students for 21st century careers?
- Which of the core elements of the P-TECH Model do you see yourself being particularly relevant for adaptation or use in Australia?
- What might a steering group look like in terms of make-up and sector representation, especially considering which entities have the ability to drive change?

The majority of attendees agreed that there is a really opportunity for something ‘innovative and different’ to happen in this sector of education. Moving forward, it was discussed that government and industry leaders would need to be engaged with key stakeholders (ie the bodies responsible for setting curriculum) to ensure a new initiatives success. A key component will be the inclusion of a University as part of the development process.
CONCLUSIONS AND RECOMMENDATIONS

An opportunity exists in Australia to build on the momentum created by the research. Recommendation 1 is already underway and has already gained traction with a large number of groups including schools, educators, a major university, 3 large corporations and representatives of Government engaged.

Recommendation # 1

- Work towards development of a new educational innovation in Australia, using core strengths of the P-TECH style school innovation and adapt it to suit the Australian environment and employer needs.

Disseminate information:

1. Establishing a steering group to continue the conversation with interested parties

2. Media. An opinion piece written jointly with Stanley Litow, the Vice-President of Corporate Citizenship and Corporate Affairs and President of the IBM International Foundation was published in The Sydney Morning Herald and The Melbourne Age (as well as 13 other regions) on the 6th December 2013 on my return. This has sparked interest from a variety of corporations and other interested parties who wish to be involved in this initiative moving forward. http://www.smh.com.au/national/education/closing-the-itc-skills-gap-20131206-2ywar.html?ixzz2rwupwiqS. More media is expected to follow.

Recommendation # 2

- A re invigoration and modernising of the Australian Apprenticeship schemes to ensure that apprenticeships are seen as attractive pathways for people undertaking the school to career transition.

Disseminate information:

1. Engage Government(s) to establish an independent working group to consider how to modernise Australian Apprenticeships.

2. Media: I learned how in modern economies, apprenticeships are regarded as important ways of developing skills in the workforce along with their role in reducing youth unemployment. Currently Australian Apprenticeship numbers are plummeting and opportunities exist to engage educational reporters in main stream Australian media.
A new approach to engaging young Australians in skilled careers

Nicholas Wyman knows a thing or two about finding people a job, but what he wants to know is why so many young people are not interested in getting work.

Mr Wyman, from Hawthorn East, was instrumental in Leader’s Jobs 1001 campaign. Now he will travel to Europe in search of an answer, having become one of 22 Victorians to receive a Churchill Fellowship.

“I’ll visit four countries, two that have been successful in getting youth engaged in employment – The Netherlands and Germany – and two that are struggling – England and France – and in truth are probably worse off than Australia,” he said.

Mr Wyman, chief executive of WPC Group, a non-profit company that places people in jobs, said unemployment was at 1.5 per cent in the inner east, but was 12.7 per cent for youths aged 15-19.

“Australia has about a 50 per cent success rate in seeing apprentices go through to completion, whereas Germany sees about 60 per cent go through.

“The aim is to work out what they are doing and how we can do things better, but also see what other countries who are struggling do, as well.”
No work for teens

By CHARLENE MACAULAY AND VANESSA VALENZUELA

TWO out of five youths in Melbourne’s North West who are out of school are unemployed.

Federal Government statistics for the month of June show 40.5 per cent of youths aged between 15 to 19 in the North West Metropolitan region who are not in school or any full-time training institution are out of work.

Last year, that figure was as high as 55.2 per cent.

WPC Group CEO Nicholas Wyman said the figure meant the region was up there with the worst youth unemployment in the world.

Mr Wyman said the WPC Group, which specialises in the employment and training of apprentices and trainees, had 125 apprenticeships on offer in Victoria with next to no takers.

“Is it poor pay, or the fact that the Youth Allowance is the same as first-year apprentice wages? “Youth unemployment and engagement into the workforce is a huge problem, and it’s a huge problem in Melbourne’s West, apart from anywhere else.”

Mr Wyman was recently awarded a Park Family Churchill Fellowship which he will use to travel to Germany and the Netherlands - who are performing better in their youth retention rates - and find out how they are doing it.

He is also going to France and the UK - who face similar problems to Australia - to see how they’re trying to fix the problem.

Caroline Springs resident Hine Tomtey, 19, has been struggling to find work over the past six months while she is on a gap year.

Ms Tomtey told Star that businesses did not want to hire anyone without any experience.

The Brotherhood of St Laurence has been helping her write up resumes and conduct practice job interviews.

“I reckon it is hard to find a job in the West,” Ms Tomtey said.

“One of the shops here are hiring. They said that I should look for a job after July. Now they have said I should wait until November.

“I want to go to work and then go to uni. Right now I have no money to buy the resources I need.”

Federal Employment Minister and Maribyrnong MP Bill Shorten said the Government was working with a wide range of community groups to help get unemployed youth into work.

“There have been some great successes,” Mr Shorten said.

“It’s not like the 1970s when unemployed young people were left to sink or swim on their own. We believe in leaving nobody behind.

“Looking at the bigger picture, I’m certain that the answer to both unemployment and productivity growth is skills; I would like to see more young people remaining in study and training.”

State Employment Minister Richard Dalla-Riva’s office did not respond to Star’s request for comment.

Researching Skills in 2013:
Churchill Fellowship

WPC Group CEO Nicholas Wyman was presented with the 2012 Park Family Churchill Fellowship by The Governor of Victoria Alex Chernov recently. Nicholas is particularly interested in the challenges companies face in finding and developing skilled employees. Nicholas will be researching and reporting on youth unemployment and the transition between school and the world of work in Australia, Germany, France, the UK and the Netherlands. Other Churchill fellows for 2012 include Dr Stuart Ralph who was awarded the The Dr Dorothea Sandars Churchill Fellowship to investigate open source strategies for developing drugs against neglected parasitic diseases in India.
Youth unemployment soars

By CHARLENE MACAULAY and VANESSA VALENZUELA

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Youth jobs crisis

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A new approach to engaging young Australians in skilled careers

Park Family Churchill Fellowship 2012

Nicholas Wyman

20 Jul 2012 12:00 AM

WPC Group chief executive Nicholas Wyman was awarded a Churchill Fellowship to investigate why Australia has a skills shortage.

The day Ford announced it was going to lay off 440 people, six months after the government had given the company $34 million, I rang Ford and offered to take on all its apprentices. They were a bit taken aback. They said: “Oh, wait a minute, we’re not going to lay anyone off right away.”

But I need those apprentices, and I don’t think it is sustainable to prop up some of these industries when there are emerging industries that need investment.

The question is: How do we tell young people what new opportunities are available? How do we give them the information they need to make the right career choice? That is where we have a missing link.

Our organisation employs 650 apprentices nationally and I have 100 apprenticeships going begging. Horticulture, automotive and hospitality are desperate for good people. There’s a huge shortage of people who want to be chefs, despite the hype about MasterChef.

Another misunderstood trade is automotive. Parents and careers teachers think it’s all grease and grime and lying under a car, but these days cars are fairly high-tech. We have apprentices at Porsche and Mercedes-Benz. Those employers want people who have completed year 12, and they set the bar high.

The problem is, people choose a career without knowing what it is like, and now we have youth unemployment that is three or five times higher than the adult rate. Out in Broadmeadows, it was 35.9 per cent this month. In Hawthorn East, where I live, general unemployment is 4 per cent but youth unemployment is 13 per cent. How is that possible? Disengagement? Poor careers advice? Parents who have an idea of a pathway that doesn’t suit the child? Meanwhile, employers are saying: “We can’t get the job done, we have to bring in 1600 foreign workers to do it.”

I don’t think welfare helps the situation. One guy said to us last week: “Gee, I get paid more for sitting at home than I do for taking that automotive job.” That boy will be very hard to place with an attitude like that.

Melbourne Weekly, Melbourne

01 Aug 2012, by Alan

Letters, page 11 - 47.14 cm²

Suburban - circulation 110,027 (--W----)

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APPENDIX
Annotated Biography and Bibliography of Dr Professor Felix Rauner, University of Bremen, Germany

Biography

innovativeapprenticeship.org, 8 Dec 2013 [cached]

Felix Rauner

Professor at the University of Bremen (Germany) Former director of the Institute for Technology and Education

Dr. Rauner is one of the foremost experts on apprenticeship in the world. He is co-founder and former director of the International Network on Innovative Apprenticeship (INAP). Not only has Dr. Rauner written and edited scores of books dealing with apprenticeship and Technical Vocational Education and Training (TVET), but he has trained many graduate students who have developed apprenticeship programs and systems in other countries and has worked with businesses, worker organizations, and governments to structure high quality apprenticeship programs. Dr. Rauner is Advisory Professor at the East China Normal University (Shanghai, China) and Tongji University, Chairman of international research networks and editor of the Handbook of TVET Research.

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Felix Rauner ...
innovativeapprenticeship.org, 8 Dec 2013 [cached]

Felix Rauner
Prof. Felix Rauner, Institut ... www.unevoc.unesco.org, 27 Aug 2012 [cached]

Professor Felix Rauner of the University of Bremen (Germany) and joint editor of the Handbook, as well as Ms Alix Wurdek, Head of Publications at UNESCO-UNEVOC, introduced the publication to the guests.

Bibliography


This report provides a detailed examination of employment, work and training in the motor vehicle repair and sales sector in Germany. The first section of the report provides a sectoral overview, including structure and general characteristics, and describes current developments in employment, technology, work, education and training on a sectoral level. The second section comprises five case studies of companies, providing an analysis of company organisation, working conditions, the impact of technology, and continuing vocational training programmes. The final section draws conclusions and summarises the findings of the sectoral survey and the case studies. This report is part of a series on this sector, each dealing with a different Member State of the European Union. These reports are indexed from TD/INT 58.470 to TD/INT 58.479.


This document is a European synthesis report on employment, work and training in the motor vehicle repair and sales sector. It is based on the 12 national reports of sectoral surveys conducted in the Member States of the European Community as part of the FORCE programme. The survey focused on the planning of continual vocational training at company level and sought to identify and analyse the best and most significant experiences. The first section of the report outlines the framework of the study, the structure and characteristics of the sector in the context of the European Community, and highlights the changing nature of repair workshop tasks and the implications for skill requirements and continuing training. The following section presents a comparative analysis of vocational training systems, in terms of structure and content in the Member States. The final section outlines trends emerging from the case studies in relation to quality competition on a global market, the impact of technology on tasks, skill requirements and development, continuing vocational training needs, environmental requirements, financing and work organisation. The national reports are indexed from TD/INT 58.470 to TD/INT 58.479.

Trends in training for employment in the motor vehicle repair and sales sectors in the 12 European Community (EC) countries were identified through a review of 12 national reports that were prepared by 16 research teams involved in an EC study on continuing training in the motor vehicle sales and repair sector. Special attention was paid to the following topics: structure and characteristics of the motor vehicle sector in the EC; changing tasks in repair workshops and implications for skill requirements/ development; and objectives, content, and delivery of continuing vocational training of the sector’s work force. The following are among the trends and issues identified: increased quality consciousness; standardization and modularization versus transferability and mobility; adaptive versus forward qualification and qualification planning; roles of the providers of continuing
vocational training; training concepts and their adaption to the needs of individual countries and repair shops; control versus cooperation of manufacturers and dealers; and high quality service stations as sites for vocational and continuing training. (Contains 23 tables/figures and 15 references. Appended are diagrams of the technical training scheme and technical service training curriculum identified and a table detailing registration of passenger cars in Western Europe by country in 1985-1992.) 


In this chapter, a framework is established using four models of the school-to-work transition: (i) direct transition; (ii) deregulated transition; (iii) regulated overlapping transition; and (iv) shifted transition. The Dual Vocational Training System in Germany is presented as a key to smooth transition from school to work, and it is concluded that the satisfactory transition from the educational to the employment systems for as many young people as possible depends on the training commitment of enterprises to provide attractive traineeships and occupational careers within the framework of dual vocational training.

The complete volume from which this chapter is indexed may be found at TD/TNC 64.16. Individual chapters are indexed from TD/TNC 64.18 to TD/TNC 64.32.


Within a broad context of globalisation, some regions of Europe continue to prosper and the author suggests that these regions give prominence to learning and can be labelled ‘learning regions’. These regions draw on the innovative creativity of the people in their communities and the skills and knowledge of regional organisations such as universities, vocational training institutions and enterprises. This brief paper emphasises the tensions between globalisation and regionalisation in Europe and outlines some of the underlying values and principles of European regional development strategies in order to highlight how these tensions can be addressed.

The volume of collected papers is indexed at TD/TNC 62.277.


The authors provide an overview of the dynamically developing area of work-oriented and work-process-oriented vocational training research. The chapters on the volume show that research into qualifications is the precondition for the development of vocational training processes and that the didactic focus of vocational training processes is the knowledge of work processes. The authors argue that an interdisciplinary approach is needed. The chapters are organised into four major areas: (1) research into occupational fields and skilled work; (2) knowledge of work processes as a problem for education theory; (3) the process of work and work process knowledge - practical studies; and (4) knowledge of work processes - work tasks and curriculum.


The expertise addresses the question of the possible contribution that vocational training can make to managing structural changes in the handicrafts. The point of departure of the analysis and the objective informing the recommended reform concept are based on a shift of perspective from a situation in which vocational training is belatedly adjusting to structural changes in a situation in which vocational training is a promoter of change. The expertise recommends maintaining the German concept of regulated occupation, moving from a dual system of vocational training to a cooperative system and creating open, dynamic occupational profiles. The authors also stress learning in the context of learning organisations, on-the-job learning and improving computer-based work systems that promote learning.


Many workplaces are being affected by major changes related to the introduction of new technology, the emergence of more flexible forms of work organisation, and the ongoing intensification of work itself. These new forms of work place new demands on workers’ knowledge and skill. In this chapter, the authors discuss the implications for vocational education and training (VET) of acknowledging the importance of work process knowledge in the modern workplace. Work process knowledge is defined as the knowledge, mostly constructed in the workplace through work experience and the work itself, that actively informs the work of the skilled worker, and requires an understanding of the whole work process including preparation, action, control and evaluation. The authors focus their discussion on the acquisition of work process knowledge and the role of formal systems of VET in the acquisition process. The chapter concludes with an example of how work process knowledge can be used as the organising principle for curriculum development.

The volume from which this chapter is taken is indexed at TD/TNC 71.253. Selected chapters are indexed from TD/TNC 71.254 to TD/TNC 71.259.
This publication is based on two papers which were developed in collaboration between the authors in the course of the [European Union] EU-Commission funded project 'Euroframe: Framework for Continuing Professional Development for VET Professionals.' The first part of this document is the presentation of ideas concerning the establishment of a networked European university for the education and training of [vocational education and training] VET and [human resources development] HRD professionals and its possible implementation. The second one is a blueprint for a curriculum of a Master Study Course on VET and HRD, the Master of Professional Education (MPE). The papers are intended to serve as an input for the further discussion concerning the professionalisation of this important occupational group in a knowledge-based economy. They are also based - besides the work on the mentioned project - on the results of a number of research and development projects in which the authors were involved.

Published abstract.


This document contains the presentations from the workshop 'Rediscovering Apprenticeship,' held in Bremen, Germany in 2006. Workshop 13 was part of the 14th Hochschultage Berufliche Bildung organised by the University of Bremen. The workshop focused on the dialectic interrelation of internationalisation and localisation. An outcome of the workshop was the founding of the International Network on Innovative Apprenticeship (INAP), an association of researchers and research institutions in vocational education and training. The workshop was essentially the first conference of the new INAP.

The contents are as follows: Introduction to W13 - Rediscovering apprenticeship: an answer to learning enterprises / Ines Herrmann, Philipp Grollmann, Felix Rauner; Apprenticeship training in Italian regions: progress and challenges / Elmo de Angelis, Ludger Deitmer; Decomposing and recomposing occupational identities: a survey of theoretical concepts / FAME Consortium; Apprentices' experiences of occupational and organisational identity formation at work / Yehuda Baruch and Aaron Cohen; The 'profitability' of in-firm vocational training to companies and apprentices / Ines Herrmann, Philipp Grollmann, Felix Rauner; The Danish VET system as a framework of case descriptions and analyses / Jette Harrebye; Value adding to apprenticeships: how an Australian construction company invests in apprentices to produce future senior managers / Erica Smith; Rediscovering apprenticeship?: the Austrian perspective / Peter Schloegl.


This volume contains international theory and empirical research on the topic of continuity and change in identity formation processes at work in the context of changes in working processes and labour market requirements. This context may lead to new forms of mobility and flexibility for both employers and employees. The various contributions present perspectives from sociology, psychology, organisational management and vocational education and training (VET). The aim is to present a new research area that takes an interdisciplinary and international perspective and connects debates about human resources development, skills formation and career development with those about individual's work commitment and vocational orientations. The editors, Alan Brown, Simone Kirpal and Felix Rauner contribute the first chapter entitled 'Introduction and overview'. Part one, 'Vocational identity in theory and empirical research', contains the following chapters: Decomposing and recomposing occupational identities: a survey of theoretical concepts / FAME Consortium; Tensions in the vocational identity of Danish bankers / Morten Smistrup; The role of developing a vocational identity for women: the example of young single German mothers / Gwendolyn Paul and Uta Zybell; The 'double' vocational identity of the working population in the Greek tourist industry / Nikitas Patiniotis and Gerasimos Prodromitis; Vocational education and training: a European perspective / Felix Rauner. Part two, 'Work and personal identity', contains the following chapters: Career changes and identity continuities: a contradiction? / Sabine Raedt and Gudela Grote; Exercising self through working life: learning, work and identity / Stephen Billett; The much vaunted 'flexible employee': what does it take? / Simone Kirpal and Alan Brown. Part three, 'Work and commitment', contains the following chapters: The dynamics between organisational commitment and professional identity formation at work / Yehuda Baruch and Aaron Cohen; Apprentices’ experiences of occupational and organisational commitment: an empirical investigation in a German automobile company / Bernd Haasler; The individualisation of identification with work in a European perspective / Simone Kirpal, Alan Brown and M’Hamed Dif; Work identity in the Japanese context: stereotype and reality / Akihiro Ishikawa. Part four, 'Modern work and the creation of new professional identities', contains the following chapters: The construction of a new professional self: a critical reading of the curricula for nurses and computer engineers in Norway / Monika Nerland and Karen Jensen; US efforts to create a new professional identity for the bioscience industry / David Finegold and Robert Matousek. Alan Brown and Simone Kirpal conclude the contributing chapter. Selected individual chapters are indexed from TD/TNC 89.489 to TD/TNC 89.491.

This introductory chapter makes some comparisons across the individual country chapters in the book. It begins by looking at the significance of technical and vocational education and training (TVET) and the status of its teachers, noting the paradox of their low status in light of their essential role in supporting skills development in the workforce. The authors then set the context for the examination of TVET teaching and training in a number of countries by describing four models of school to work transition that can be distinguished. Several broad clusters of teachers and trainers are identified in terms of their teaching roles. A range of TVET institutions, their practice of teaching and employment of teachers are examined, followed by structural determinants of TVET professionalisation and basic models of TVET teacher education that can be recognised. The chapter concludes by touching on the challenges and perspectives for the professionalisation of TVET teachers and lecturers.

The volume from which this chapter is taken is indexed at TD/IRD 88.428. Individual chapters are indexed from TD/TNC 94.252 to TD/TNC 94.263.


This publication examines the history and current status of teaching in technical and vocational education and training (TVET) in several different countries from around the world. It presents studies of the profiles of teachers and lecturers and their educational practices in the following countries: Germany, Brazil, Denmark, China, France, Japan, Norway, Russia, Turkey, the UK and the USA. Each chapter covers the historical development of the TVET profession for that country, the current situation and teacher education arrangements. The chapters are as follows: TVET teachers: an endangered species or professional innovation agents? / Philipp Grollmann and Felix Rauner; TVET teachers in Brazil / Beatrice Laura Carnielli, Candido Alberto Gomes and Cleia de Freitas Capanema; China’s TVET teachers and their professionalisation / Ziqun Zhao and Lianwei Lu; The professional situation and training of vocational teachers in Denmark / Soren P. Nielsen; Teachers of technical and vocational education in France / Vincent Troger and Wolfgang Horner; TVET teachers and instructors in Germany / Waldemar Bauer; The development and present situation of vocational and technical teachers’ professions in Japan / Moriki Terada; Technical and vocational education and its teacher training in Norway / Anne-Lise Hostmark Tarrou and Icara da Silva Holmesland; Vocational teachers in Russia / Wolfgang Hellwig; TVET teachers and lecturers in Turkey / Ferdi Boyнак and Mustafa Meral; Perspectives on teachers of vocational and technical education in the UK / Norman Lucas; Career and technical teaching and teacher education in the United States of America / Richard L. Lynch and Sheila K. Ruhlland.

Individual chapters are indexed from TD/TNC 94.252 to TD/TNC 94.263.

Researchers from 13 different countries participated in this international conference on apprenticeship research. The conference comprised three keynote addresses and three workshops. The keynote papers are: The crowded market: agencies dealing with apprenticeships in Australia / Erica Smith; Apprenticeship systems in the German speaking countries: different logics and policies with respect to full-time VET and higher education / Thomas Deissinger; Apprenticeship (AP) and enterprise-based learning in the Mediterranean region / Helmut Zellöth and Richard Sweet. Papers from the first workshop, ‘Interventions by government and other stakeholders in apprenticeships’, chaired by Erica Smith are: Workplace trainers: provisional principles for an open architecture of professional development / Graham Attwell, Philipp Grollmann and Eileen Luebcke; Towards innovative apprenticeship: the evaluation of the development of integrated regional vocational education and training centres in Hungary / Magdolna Benke; The Italian apprenticeships: the results of the latest reform / Sandra D’Agostino; Competence development through workplace learning: the case of the French vocational baccalaureat from Vocational Lycees and the Maisons Familiales Rurales / Benedicte Gendron, Jean-Claud Floutard, Cecile Gendre and Pascal Varnier; Innovation and the Swiss vocational education and training system / Philipp Gonon; Apprenticeship in the United States: patterns of governance and recent developments / Robert I. Lerman; The long winding road to Ireland’s 1993 national apprenticeship programme / Barry Nyhan; Plural administration in dual systems in selected European countries / Felix Rauner, Wolfgang Wittig and Ludger Deitmer. Papers from the second workshop, ‘Designing optimal conditions for administration in dual systems in selected European countries / Felix Rauner, Wolfgang Wittig and Ludger Deitmer. Papers from the second workshop, ‘Designing optimal conditions for workplace learning: preliminary suggestions of the project TNC 100.244. The development of curricula and their implementation is one of the key competences of teachers in the area of educational planning and practical training for technical and vocational education and training (TVET) institutions and training companies. It also plays a central role in the preparation of vocational school-teachers. The present section contains a total of 18 chapters that address this topic. The chapters in the first part are concerned with the foundations and practice of curriculum development, including theoretical learning foundations and methods of research on curricula. The second part summarizes those contributions that concentrate on the implementation of vocational and occupational curricula. Organizations, design and evaluation of vocational processes are the main points of interest. First [in this overview], the major features of this complex theme will be explained in order to provide the reader with an introduction that will assist in studying individual chapters.

The book from which this chapter is taken is indexed at TD/TNC 100.51. Individual chapters are indexed from TD/TNC 100.52 to TD/TNC 100.244.


This chapter focuses on the issue of qualifications research. The author contends that due to the massive changes taking place in the world of work, equally large changes have occurred in occupational structures and in the qualification requirements for employees. These developments have resulted in the need for new occupational profiles and the modernisation of traditional occupations. This has led to a need for improvements and changes in curriculum design. Qualifications research is the way by which curriculum design changes are fueled. In this chapter different approaches to this field are presented.

The book from which this chapter is taken is indexed at TD/TNC 100.51. Individual chapters are indexed from TD/TNC 100.52 to TD/TNC 100.244.


The development of curricula and their implementation is one of the key competences of teachers in the area of educational planning and practical training for technical and vocational education and training (TVET) institutions and training companies. It also plays a central role in the preparation of vocational school-teachers. The present section contains a total of 18 chapters that address this topic. The chapters in the first part are concerned with the foundations and practice of curriculum development, including theoretical learning foundations and methods of research on curricula. The second part summarizes those contributions that concentrate on the implementation of vocational and occupational curricula. Organizations, design and evaluation of vocational processes are the main points of interest. First [in this overview], the major features of this complex theme will be explained in order to provide the reader with an introduction that will assist in studying individual chapters.

Published introduction.

The book from which this chapter is taken is indexed at TD/TNC 100.51. Individual chapters are indexed from TD/TNC 100.52 to TD/TNC 100.244.
In this chapter, the author examines the question of whether technical and vocational education and training (TVET) research can draw upon the methods of other scientific disciplines, or if it should (or has already) develop its own research methods geared towards specific aspects of TVET. The author looks at the problems of subject-related research in general before proceeding to discuss the analytical dimension of TVET research. The chapter concludes with a discussion of whether the fundamental research methods (observation, experiment, interview and content analysis) require specific adaptations for TVET research.

The book from which this chapter is taken is indexed at TD/TNC 100.51. Individual chapters are indexed from TD/TNC 100.52 to TD/TNC 100.244.


The author states that research on technical and vocational education and training (TVET) is a relative newcomer within the field of educational research, with the first state institutes for TVET research appearing in the second half of the 20th century. TVET research is wide-ranging, including research into further education, training and qualification of TVET teachers, national structures and systems and international comparative studies. It also includes research on the interface between general and vocational education and transitions from vocational education to either higher education or to the labour market. The author gives an overview of the various fields of research within TVET and looks towards an international community of TVET researchers. The overview concludes with a brief description of the remaining chapters in this section.

The book from which this chapter is taken is indexed at TD/TNC 100.51. Individual chapters are indexed from TD/TNC 100.52 to TD/TNC 100.244.


Technical and vocational education and training (TVET) research has become a recognised and well-defined area of interdisciplinary research. This international handbook, the first to concentrate on research and research methods in TVET, has sections on the genesis of TVET research, research in relation to policy, planning and practice, various areas of TVET research, including vocational disciplines, and TVET systems. Case studies are used to illustrate different approaches to TVET research and the final section presents research methods, including interview and observation methods, as well as of experimentation and development. The contents are as follows: Introduction – Vocational education and training research: an introduction / Felix Rauner and Rupert Maclean; Section 1.0: Genesis of TVET research / Uwe Lauterbach; Genesis of TVET research: case study of Australia / Philip Lovered and Hugh Guthrie; Research on China’s technical and vocational education / Jiang Dayuan, Yu Zhijing and Yao Shuwei; French research on vocational training: a mirror of the position and structure of the training system / Philippe Mehaut; On the genesis of TVET research in Germany / Felix Rauner; History of vocational education and training in the United States / Cecilia Maldonado and Sterling Saddler; Overview of research concerning vocational education and vocational training in modern Japan / Susumu Sasaki; UNESCO’s research on TVET and skills development / Keith Holmes and Rupert Maclean; Research on TVET and skills development by selected intergovernmental organisations and bilateral agencies / Keith Holmes and Rupert Maclean; Steps towards international comparative research in TVET / Uwe Lauterbach.

Section 2.0: VET research in relation to VET policy, planning and practice / Anneke Westerhuis; VET research and social dialogue / Jonathan Winterton; Work - education - training: an interdisciplinary research approach / Manfred Eckert; Occupations and occupational areas / A. Willi Petersen; Vocational education research as an innovation process / Ute Laur-Ernst and Georg Hanf; Research on technical and vocational education and training (TVET) in the context of European cooperation / Pekka Kamarainen and Martin Fischer; Research and VET reform policy in transition countries / Peter Grootings and Soren Nielsen; Development aid and VET research / Godehard Kohne and Reinhard Stockmann.

Section 3: Areas of VET research; 3.1 The development of occupations / Georg Spottl and Morgan Lewis; Occupational research / Werner Dostal; Sector analyses / Georg Spottl; Historical occupational research / Falk Howe; Prognostic and prospective vocational education and training (VET) research / Philipp Grollmann; Qualification research / Otfried Mickler; 3.2 Research in the vocational disciplines / Jorg-Peter Pahl and Felix Rauner; Business and administration / Antje Barabasch; EEE/ICT in selected European countries / Klaus Jenewein, Alison Shilela and Len O’Connor; Construction / Johannes Meyser and Ernst Uhe; Agriculture / Martin Mulder; Health/care / Ingrid Darmann, Regina Keuchel and Florence Myrick; Education/social pedagogy / Maria-Eleonor Karsten; Nutrition / Barbara Fegebank; 3.3 VET systems research / Thomas Deissinger; Comparative research on technical and vocational education and training (TVET): methodological considerations / Philipp Grollmann; Comparative VET research: methodological considerations, results and current questions / Hubert Ertl and Dietmar Frommberger; Historical VET research: case studies - Research on vocational education history in China / Giding Yu and Zhen He; Vocational educational theory’s historical research on vocational education and training (VET) / Gunter Patzold and Manfred Wahle; Historical study on the western school model of TVET in Japan / Tatsuo Horiiuch; Historical research in vocational education: a case study of the United States / Cecilia Maldonado and Sterling Saddler; National and international reporting on VET: case studies - National reporting on VET: case study of Australia / Philip Lovered; Report on vocational education in China / Lin Sun; Germany / Heinrich Althoff and Elisabeth M. Krekel; VET reporting: case study of the USA / Lisa Hudson and Karen Levesque; National and international reporting on VET: case study of the European Union / Friederike Behringer; National and international reporting on VET: case study of OECD, ILO and the World Bank / Simone Kirpal; Development and evaluation of VET courses / Thomas Deissinger and Jurgen Zabeck; VET research on pre-vocational education: case studies - Vocational guidance and work orientation / Heinz Dederer; Prevocational education: case study of UK / Karen Evans; Pre-vocational education in the Netherlands /
innovation transfer through a German-Chinese research and development project / Zhao Zhiqun and Xu Han; The assessment: knowledge, skills and competitiveness / Ewart Keep and Ken Mayhew; Learning to cook: analysing apprentices’ knowledge and skill construction in the workplace / Susan James; Transferability, flexibility, mobility as targets of vocational education and training: the COST Action A11 / Frank Achtenhagen and Susanne Weber.

Section 5: Research methods; 5.1 Methodological aspects / Georg Hans Neuweg and Peter Putz; Subject-related research approach: vocational work and education processes / Felix Rauner; Situated learning in communities of practice as a research topic / Christoph Clases and Theo Wehner; Distance and proximity in VET research / Lars Heinemann; Shaping-oriented research and interdisciplinarity / Gerald A. Heidegger; The tacit and implicit as a subject of VET research / Georg Hans Neuweg; On the implementation of basic methods in vocational training research (observation, experimentation, interviewing, content analysis) / Rainer Bremer; 5.2 Research methods: interview and observation methods / Winfried Hacker; Technical interview / Manuela Niethammer; Action-oriented specialised interviews / Matthias Becker; Task analysis in vocational science / Peter Roben; Expert skilled worker workshops / Georg Spottl; Knowledge diagnosis / Winfried Hacker; Assessing vocational competences / Bernd Haasler and John Erpenbeck; Situation film / Felix Rauner; Studies of work / Jorg R. Bergmann; 5.3 Experimentation and development / Peter Roben; Laboratory experiments and quasi experiments / Gerald A. Straka; Katja Meyer-Siever and Johannes Rosendahl; Qualitative experiments / Franz Stuber; Experimental research designs (ERD) in vocational education / Peter F. E. Sloane; Participative development / Bruno Clematide; Interdisciplinary development / Felix Rauner; 5.4 Evaluation, quality development and assurance / Jurgen van Buer and Eugenie A. Samier; Evaluation research / Gerald A. Straka; Participative quality assurance / Philipp Gonon; Output orientation as aspect of quality assurance / Sabine Kurz; Educational controlling / Jurgen van Buer; Benchmarking in vocational education and training / Susan Seeber; Programme evaluation / Ludger Deitmer; Knowledge management / Michael Dick and Theo Wehner.


The QEK (quality, returns and costs) self-evaluation tool allows companies to assess the cost-effectiveness as well as the quality of apprenticeships. Analysing the results of more than 100 companies taking part, we found that, on average, apprenticeships produce net returns. Furthermore, there is a positive correlation between quality and cost-effectiveness. The higher the quality, the better the cost-effectiveness.

Published abstract.

The volume from which this chapter is taken is indexed at TD/TNC 101.305. Individual chapters are indexed from TD/TNC 101.306 to TD/TNC 101.319.
Rediscovering apprenticeship: research findings of the International Network on Innovative Apprenticeship (INAP).


The rediscovery of the value of apprenticeships has been one of the most significant trends in vocational education in recent years. In this volume, the renewed interest in the apprenticeship tradition and the various steps towards the implementation of innovative apprenticeship programs are analysed and discussed from different perspectives. The beginning chapters describe recent developments in apprenticeship training in different national contexts. The remainder of the book analyses the way in which both the quality and profitability of apprenticeship act in concert as the most influential drivers of innovation in this field.

The chapters are as follows: Introduction: rediscovering apprenticeship / Felix Rauner and Erica Smith; Competence development through workplace learning: the case of the French vocational baccalauréat / Benedicte Gendron; The transition from vocational education and training to higher education in the German-speaking countries / Peter Schlogl; Plural administration in dual systems in selected European countries / Felix Rauner, Wolfgang Wittig and Ludger Deitmer; Creating the social foundations for apprenticeship in Ireland / Barry Nyhan; Italian apprenticeship reform: impact from national and regional perspectives / Sandra D’Agostino, Elmo De Angelis and Ludger Deitmer; Towards innovative apprenticeship: the evaluation of the development of integrated regional VET centres in Hungary / Magdolina Benke; The distinct nature of work-based VET in England: a reflection of employer interests? / Michaela Brockmann, Linda Clarke and Christopher Winch; We need them, they need us: work-based learning programmes for young people in the Mediterranean region / Richard Sweet and Helmut Zelloth; We’re here to help: agencies dealing with apprenticeships in Australia / Erica Smith; Apprenticeship in the United States: patterns of governance and recent developments / Robert I. Lerman; Comparing two cases of training practice: implications for trainers’ professional development / Philipp Grollmann; Facilitating learners’ motivation and competence development in the workplace: the UK context / Natasha Kersh and Karen Evans; Coaching and collaborative work based learning in Dutch VET: the ‘TEAMstages’ project / Jeroen Onstenk; Costs, benefits and quality of apprenticeships: a regional case study / Felix Rauner and Lars Heinemann in collaboration with Dorothea Piening and Rainer Bischoff.

Individual chapters are indexed from TD/TNC 101.306 to TD/TNC 101.319.


Since 2008, the [competence development and assessment in TVET] COMET project - large scale competence diagnostics in the electro-technical occupations - aims at measuring occupational competences. Using a competence and measurement model, associated instruments on commitment and vocational identity, open test tasks were developed to measure occupational competence. Since then, the project has been conducted with over 800 apprentices in German Lander Hessen and Bremen and been enlarged in scale and scope to German technical colleges as well as China. This paper will focus on three findings: heterogeneity of competence levels as well as profiles, competence differences between different technical colleges, and the use of the COMET approach as a learning model in [vocational education and training] VET schools.

Published abstract.


In the Beijing region of China, the occupational competence of students of different vocational schools was tested. The results show an overall relatively low competence level with remarkable differences between schools. One of the main findings shows that there is no competence development comparing 2nd and 3rd year students - it seems to be difficult to mash learning at school and at the workplace. Moreover, the students show a strong degree of heterogeneity concerning their competencies. Often, in the same class we find students that differ more than a year in their competence development.

Published abstract.


This study analyzes the key determinants of the effectiveness of collaboration between public and industrial training institutes. It aims at developing potential factors and eventually a framework that can be alternative solutions to enhance cooperation between the stakeholders in apprenticeship training. The close collaboration of industry and institute can develop a competent and highly skilled workforce. Consequently, quality work based training in vocational education and training for apprenticeship performance can be realized. Therefore, evaluation feedback on the quality of teamwork of the experts, trainers, teachers and apprentices are used to develop a framework for effective collaboration. This sample consists of 30 interviews, 100 survey questionnaires and four focus group discussions and workshops.

Published abstract.

Permeability and progression between vocational and higher education is a major topic for education research and policy at national and international levels. But successful examples of continuous dual learning pathways are rare. This article suggests the implementation of a regulatory framework for the transition from vocational education to higher education and draws a distinction between different career tracks.

Published abstract.


This book is a summary of papers presented and discussed at the fourth International Network on Innovative Apprenticeship (INAP) international conference held in Beijing, China on 26-27 May 2011. The conference focused on four key topics: (1) developing curricula and qualification systems; (2) learning and development theories and models; (3) multiple roles of universities, schools and their teaching and training staff; and (4) measuring competence development.

The contributions are as follows: Introductions (Felix Rauner and Erica Smith; Zhiqun Zhao); Keynotes: The apprenticeship approach: a way to overcome demarcations between vocational and higher education / Felix Rauner; Apprenticeship as a model for the international architecture of TVET / Philipp Gonon; School-enterprise cooperation in China’s vocational education and training / Zhiqun Zhao. Topic one, ‘Developing curricula and qualification systems’, contains: Apprenticeship growth and quality in England / Richard Marsh; Curriculum reforms in VET in Europe: a comparative view on France and Germany / Dietmar Frommberger and Lena Krichewsky; Study on the implementation of the learning field curriculum in Germany / Han Xu; Are we ready for the new round of TVET development based on China’s National Plan for Medium and Long-term Education Reform and Development (2010-2020) / Wei Ping Shi and Ying Kuang: The link between the didactic approach of the vocational training system and the curriculum development approach / A. Willi Petersen and Lihua Xie; Implementation of work process based curriculum in technician institutes / Zhiqun Zhao; From ‘deep blue’ to ‘deep green’: case study on the project of TVET for SD in China / Chunlin Huang; Globalization and apprenticeships: does apprenticeship survive in transnational companies? / Philipp Gonon, Ute Hippach-Schneider and Tanja Weigel; A qualitative research of curriculum development in China’s further vocational education: the staff’s perception / Bin Bai; Entrepreneurship through apprenticeships: the need, practice and interim evaluation - case Finland / Asko Miettinen and Kari Viinisalo; Considerations of curriculum integration of general education and nursing technology profession / Hui-Chen Hung; Pre-apprentice programs and their impact on apprenticeship completion / Tom Karmel and Damian Oliver; A model for redesigning levels and types of national technical qualifications based on national competency standards in South Korea / Seung-il Na, Young-Mi Seok, and Doo-Jin Jung; National context of apprenticeship training in South Africa: possibilities and challenges in a new structural order / Salim Akoojee; ‘Working-learning integrated’ curriculum development practice and reflection: taking vehicle maintenance specialty as an example / Ling Deng, Xingshun Qin and Qingyao Wei; Apprenticeships and community colleges in the United States: complements or substitutes? / Robert I. Lerman; Apprentice work process knowledge enhancement in post-recession Ontario / Daniel Brooks.


Topic three, ‘Multiple roles of universities, schools and their teaching and training staff’, contains: Eight characteristics of good ‘automotive teachers’: consequences for the TT-TVET / Ralph Dreher; New approach for teacher training in Austria / Peter Hartel and Michaela Marterer; Networks as agents of innovation: networking patterns of VET and higher professional education teachers / Krista Loogma and Kulliki Tafel-Viia; Towards a new kind of VET teachers’ professional competence structure / Zhi gang Zhou and Zhiyong Yan; The ‘PIL’ project: improving employability through the integration of education, training and work / Giovanni Masino and Andrea Gandini; Teachers’ skills development model in the evaluation of competency-based student learning outcomes in vocational schools in Indonesia / E. Kosasih Danasasmita; Building pre-service teachers’ capability through cognitive apprenticeship / Lijun Wang and Ye Cao; From quality management towards school development: the establishment of a new quality development concept - conclusions from a Chinese and German teacher training pilot project cooperation / Joanna Burchert, Ludger Deitmer, Feng Shi, Yubo Wang; Australian vocational education teachers’ qualification and standards: experience and borrowing from TAA training packages / Hong Lu and Dequan Zhu; Research on operation mechanism of new apprenticeship in cultivating model in hospitality management of high vocational college / Yulin Jin; Framework for effective collaboration between public training institute and industries in vocational education and training of apprentices / Ramli Bin Hj, Rashidi, Felix Rauner, Ludger Deitmer and Sulaiman Bin Hj. Hassan; Reforming VET teacher education / Bonnie Watt-Malcolm; Training needs analysis in economic teaching on the suitability of the Test of Economic Literacy (TEL) / Volker Bank and Thomas Retzmann; Master education of vocational instructors / Jianrong Zhang and Luna Huang; Industrial arts for career plan in junior high school / Yasuhioko Uchida.

The chapters in this book discuss issues relating to the United States vocational system. It provides examples of the nature and delivery of vocational education and covers a range of skills that mainly fall under categories of agriculture, business, family and consumer services, health, marketing, technology, and trade and industrial education. The chapters are: Introduction / Antje Barabasch and Felix Rauner (pp. 2-14): Dilemmas of design: education versus qualification in the US vocational system / Jeff King (pp. 15-32); The multiliteracy CTE/VET system in the United States: from high school to two-year colleges / Chris Zirkle (pp. 33-52); The American community college / Carsten Schmidtke (pp. 53-76); Governing VET in the United States: localization versus centralization / David Boesel (pp. 77-100); The education gospel in workplace learning: evidence from the Swiss VET system / Wei-Ts Liu, Fei-Chuan Chen and Yui-Ming Lai; The collective nature of guidance and motivation of apprentices in a system of integrated dual VET / Ursel Hauschildt, Lars Heinemann and Felix Rauner; Competence development of apprentices and TVET students: a Chinese-German comparative study / Li Ji, Felix Rauner, Lars Heinemann and Andrea Maurer; Measuring vocational competences in electronic engineering: findings of a large scale competence measurement project in Germany / Lars Heinemann and Felix Rauner; Competence development program (CDP) for Beijing TVET teachers / Ye Tian; A research on job performance competency of general technology teachers in ordinary high schools in China / Jun Liu and Taehoon Kim; Development and field-testing of a competence-based instrument for assessing financial literacy of adolescents / Carmela Aprea; Competency development between motivational structures and working relationships / Martin Kroll; Updating the assessment criteria for national technical qualifications in South Korea / Seung-il Na, Dong-yul Jung and Hye-kyung Lim; Developing a competency model of human resource management (HRM) in vocational education for creative industry / Bambang Trisno and Fetti Poerwita Sary.

Topic four, ‘Measuring competence development’, contains: Vocational education and training (VET) quality and evaluation: its place in the US community college / Pradeep Kotamraju (pp. 195-212); Teacher education and professional development / Richard L. Lynch and Simone R. Kirpal (pp. 213-230); Reflections on US perspectives on VET / James Raymond Stone (pp. 231-250); Conclusion / Antje Barabasch and Felix Rauner (pp. 251-258).


This publication presents the latest research findings in technical and vocational education and training (TVET). Members of INAP, the International Network on Innovative Apprenticeship, and VETNET, the Vocational Education and Training Network, have contributed key research findings to this detailed survey of the field. Featuring the inclusion of the internationally recognised memorandum released in April 2012 by the INAP Architecture Apprenticeship Commission, the book examines issues relating to TVET, including exemplar architectures such as successful school-to-work transitions, competence assessment and development models, and governance, including the role of stakeholders. Part one, ‘From school into apprenticeship: pathways for a successful transition’, contains the following chapters: Relationship between potential recruits from VET and HE: case studies from Germany, England and Switzerland / Ute Hippach-Schneider, Tanja Weigel; Exploring intermediate vocational education and training for 16-19 year-olds in Germany and England / Jeremy Higham, H.-Hugo Kremer, David Yeomans; Apprenticeship, pathways and career guidance: a cautionary tale / Richard Sweet; No choice - no guidance?: the rising demand for career guidance in EU neighboring countries and its potential implications for apprenticeships / Helmut Zelloth; How can government, private sector and work based learning promote labour market relevant training in developing and transition countries? / Manfred Wallenborn; A renaissance for apprenticeship learning?: and its implications for transition countries / Soren Nielsen; Work-based learning in China / Joanna Burchert, Ludger Deitmer, Xu Han. Part two, ‘Competence measurement and development’, contains: Occupational identity in Australian traineeships: an initial exploration / Erica Smith; Competency-based training in Australia: what happened and where might we ‘capably’ go? / Lewis Hughes, Len Carins; Measuring occupational competences: concept, method and findings of the COMET project / Felix Rauner, Lars Heinemann, Ursel Hauschildt; Occupational identity and motivation of apprentices in a system of integrated dual VET / Ursel Hauschildt, Lars Heinemann; Innovative models of more interactive cooperation of VET schools and enterprise in China / Zhiqun Zhao, Zishi Luo, Donglian Gu; Developing complex performance through learning trajectories and re-creating mediating artefacts / Michael Erat; Conceptual change research in TVET / Waldemar Bauer; Experiential learning assessment and competence development for a second career: the case of alternating training programmes for professional promotion / Philippe Astier, Lucie Petit. Part three, ‘Towards an open TVET architecture: why European and national qualification frameworks do not suffice’, contains: Differences in the organisation of apprenticeship in Europe: findings of a comparative evaluation study / Felix Rauner, Wolfgang Wittig; Implementing the EQF: English as distinct from continental bricklaying qualifications / Michaela Brockmann, Linda Clarke, Christopher Winch; Trends,
This chapter describes the conceptual foundations and findings from the [Competence Development and Assessment in TVET] COMET project, undertaken by the Bremen University TVET Research Group, I.BB. After six years of experience piloting large-scale competence diagnosis in vocational education, an initial appraisal can be made of the scope and limits of this new instrument for the measurement of occupational competence. The competence levels and skill profiles of test groups from various forms of vocational training can be compared and analysed. The prerequisite is a psychometrically tested competence and measurement model. The collection of context data makes this procedure an effective instrument for the analysis and design of vocational training processes and structures.

Published abstract.


This chapter presents a comparative qualitative analysis of governance structures in the dual [vocational education and training] VET systems of Austria, Denmark, Germany and Switzerland. First, a theoretical framework for the classification of plural systems such as dual apprenticeship training is discussed. It is argued that governance in VET can be described according to the coherence of the system on the one hand and the rationale of agency on the other and that four ideal types of governance can be distinguished. First, a methodology is presented to implement this framework in data collection and analysis on the basis of desk research and an evaluation tool for expert workshops. The study recommends a consistent legal framework regarding the cooperation of learning venues and the establishment of an evaluation and feedback scheme in the shape of an assessment along the training process. In order to efficiently coordinate VET practice, VET policy and VET research, the establishment of a ‘VET innovation system’ is suggested.

Published abstract.


The [Competence Development and Assessment in TVET] COMET competence model, which was developed for the assessment of professional competence of apprentices and students in various occupational fields, has been transformed into a procedure for the comparative measurement of the professional competence of [vocational education and training] VET teachers. The new measurement model for [technical and vocational education and training] VET teachers and trainers has been tested in its first pre-test in Germany and is now ready to be applied in various international COMET projects. This article describes the foundation of the COMET teacher and trainer competence model.

Published abstract.


The transferability of vocational education and training (VET) qualifications across international borders is a current issue in this heterogeneous field of education. Key to this goal is defining a common methodology for measuring vocational competences. This publication sets out a proposal for just that, based on the results of a pilot project known as [competence development and assessment in TVET] COMET on competence diagnostics in the field of electrical engineering. The study uses longitudinal analysis to explore issues of competence development, the development of vocational identity, and occupational commitment. It focuses on two discrete occupational profiles in electrical engineering in a test of a model currently applied to other professions as well. The first section provides a full description of the theoretical framework. The model’s success in its first phase is detailed in the second part of the volume, where the authors show that the transfer of the competence framework into an empirical model was successful. They also demonstrate that the methodology can be applied to designing and evaluating VET processes, making the material relevant to VET teachers and trainers as well as academics. The chapters are: Measuring professional competence; Foundations of a competence model; The COMET competence model: foundations for the study of professional competence and identity; Test development and design of the study; Test instruments and implementation of the COMET study; Results 2008: the survey population; Results 2008: apprentices competence; Results of the main phase: The COMET rating procedure in practice: some conclusions.

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We have a real opportunity to look at secondary education differently in Australia. Secondary education is working for many Australian students, but a sizeable percentage is not being equipped for the workplace. We see the evidence in the high rate of youth unemployment among 15-19-year-olds, which is 24 per cent nationwide and about 45 per cent in many urban areas.

We cannot blame the economy for this alarming situation. Too many young people graduate from secondary school without employable skills in computer technology, engineering, electronics, robotics, auto diagnosis and repair, “mechatronics” or other fields in which demand is high. When they go looking for a job, they have too little to offer. Many of these graduates, failing to get on to an upward career track, will languish in low-paid jobs. This also hurts businesses, which routinely complain that they can’t find enough people with the right skills. And so we have a paradoxical situation: young people without jobs and jobs that go unfilled for lack of skilled applicants.

The information and communications technology industry is only one of the industries feeling the pinch. But ICT is an important and growing sector, contributing some $42 billion to the Australian economy and employing nearly half a million people. It’s also an area that our youth are most typically adept in, having grown up as digital natives. Yet ICT faces a shortage of skilled hands – not just people with four-year and graduate engineering degrees, but people with high-school-plus technical training. If we fail to find those skilled people, the ICT industry will not achieve its growth potential and the country will be the poorer for it.

The ICT skills gap is not unique to Australia; Europe, India, China, and the Americas are facing similar problems. Some are experimenting with schools that aim to close the gap with novel approaches – often in collaboration with industry. A few are really shaking things up.

In France, for example, 42 is a new computer tech school launched in Paris by telco entrepreneur Xavier Niel. Despite record high youth unemployment, French businesses cannot find enough programmers. Niel’s school aims to do something about it, breaking most of the rules of the educational establishment in the process. Applicants are selected without regard for past academic achievement. Many are school drop-outs. What matters to Niel are their drive, talent, and ability to solve problems. The small percentage of applicants who pass through 42’s rigorous screening tests are treated to a curriculum that includes problem-solving sessions that sometimes run for 15 hours a day. Think of it as a boot camp for techies.

Many US states and municipalities are also experimenting with new approaches to reinvent high school. In 2011, New York City’s Department of Education, in partnership with New York City College of Technology, City University of New York, and IBM, launched P-TECH (Pathways in Technology Early College High School). P-TECH’s grade 9-14 program provides an integrated high school and two-year college curriculum with a heavy focus on science, technology, engineering and math, while also teaching workplace skills such as teamwork and problem solving.

Grades will receive both a high school diploma and an associate degree in computer information systems or electromechanical engineering technology. The goal is to give students the knowledge and practical skills they need to either go on to four-year colleges or step into entry and mid-level jobs with technology companies.

Educational outcomes from P-TECH have been extremely positive. Attendance is approaching 97 per cent, fabulous by New York City standards, and students are scoring very well on achievement tests – so well that the state of New York is now replicating P-TECH in 16 other communities in partnership with some of the biggest ICT companies in the US, such as IBM, SAP and General Electric.

SAP and General Electric. About 6000 students will be enrolled overall.

The same model is being adopted in four Chicago schools in partnership with companies such as IBM, Cisco, Motorola and Verizon, a major US telco. New York City opened two more P-Tech modelled schools and will open another three next year. The formula for P-TECH includes a focus on technology and a structure that integrates workplace skills into the curriculum; there is a low teacher-to-student ratio (1 to 10); there are overt corporate partnerships; and standards and expectations are high.

Whatever it is, P-TECH should bottle its formula and send it around. We could use a dose of it in Australia.

High youth unemployment and our skills gap in IT, manufacturing and other industries will not go away by themselves; we need to do something about them. Reforms to traditional schools and extensive VET system would help to create game-changing improvements, we need to experiment with radically different educational models that really shake things up.

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