

CRISIS IN EDUCATION

SOCIO-ECONOMIC, POLITICAL &
CULTURAL CHALLENGES

(eds)

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CRISIS IN EDUCATION SOCIO-ECONOMIC, POLITICAL & CULTURAL CHALLENGES

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Table of Contents

INTRODUCTION

Pella Calogannakis, Nikos Papadakis, Amalia A. Ifanti 3

PART I

Educational Crisis/es and the key challenges of the liquid modernity

1. **Michael Apple**
Educational Crises and the Tasks of the Critical Scholar/Activist 4
2. **Thomas Popkewitz, Catarina Silva Martins**
New Spaces of Collective Belonging, Memory and its Fears: Fabricating the Self and "Others" 3
3. **Andreas Kazamias**
Anthropocentric Education in the Brave New World of Globalization and the Knowledge Society 33
4. **Jieyuan Sun**
Crisis and Response: Education to the Symbiosis of Nature and Humanity 33
5. **Mary Koutselini**
Re-conceptualizing the modern knowledge system 333
6. **Haim Gaziel**
The impact of globalization upon education: Universal of contextual 33

PART II

Education, Education Policy and Welfare, between Equity and Competitiveness, in the aftermath of the Crisis.

1. **Tien-Hui Chiang**
Pursuing Ideology or Conforming Reality: why does Education Shift its Function from Equity to Competitiveness in the Era of Globalization?
2. **Charls C. Wolhuter**
Crisis in the Societal Forces Shaping Education
3. **Toru Onai**
New Comers and Education
4. **Kait N. Smeraldo & Jennifer M. Silva**
Low Income, High Stakes: The Neoliberal Stronghold on Schools
5. **Amalia A. Ifanti, Andreas A. Argyriou, Foteini H. Kalofonou, Haralabos P. Kalofonos**
Financial crisis and austerity measures in Greece: Their impact on health promotion policies and public health care
6. **Nikos Papadakis, Vassilis Dafermos, Maria Drakaki, Antonis Papargyris**
Recession and social vulnerability among Youth.

PART III

Education, Cultural Politics and Multicultural Societies

1.

Wolfgang Mitter

Challenges to Education in the Tension between Universalism and Cultural Pluralism

2.

Jian Wang

The Questions and Reflections of the Multicultural Education in China

3.

Wassilis Kassis

On the normalized but still pathogenic socialization pathways towards hostility against Muslims

PART IV

Current Trends and Challenges to Higher Education

1.

Robert Cowen

Universities and TINA - "there is no Alternative?"

2.

George Psacharopoulos

Why some University Systems are Collapsing: Realities from Europe

3.

Hermenegilde Rwantabagu

Crisis of Higher Education in East Africa

4.

Binxian Zhang, Chen Wang, Pu Chen

The Crisis of the Academic Profession in China

5.

Maria Myriagkou, Argyris Kyridis, Christos Tourtouras, Christos Zagkos

Scientific immigration. The brain Drain phenomenon in Greece during the crisis era. The views of the students of the Pedagogical School of the Aristotle University of Thessaloniki.

PART V

Current Trends and Challenges to Formal Education, Schooling and Teacher Education

1.

Pella Calogiannakis, Konstantinos G. Karras

Education and Teacher Education Worldwide: what about Crisis?

2.

Yiannis Panousis

School Crisis and In-School Violence

3.

Mutsuko

Tendo

New Parental Strategies in the Era of Low Fertility Society

4.

G.D. Iordanides, T. Bakas, A. Ch.Saiti, A.A. Ifanti

Primary teachers' and principals' attitudes towards conflict phenomenon in schools in Greece

5.

Peter Earley

Global Trends and Challenges for School Leaders: Keeping the focus on Learning

6.

Eleni Katsarou

A Teacher-Designed Formative Assessment Tool in Teacher Preparation: Developing Teacher Candidates' Knowledge, Pedagogical Practice and Sensibilities in Urban Teaching

PART VI

Current Trends and Challenges to VET and HRM

1.

Loukas Zahilas

Crisis in education. VET in the 21st Century - New pressures and changing expectations

2.

Volker Rein & Shyamal Majumdar

TVET and academic Education: A blurring distinction
– new opportunities for the future

3.

Nikos Fotopoulos

VET and Employment in Modern Greece. Searching and rethinking the new role of VET in time of crisis

4.

Jose-Manuel.Galvin-Arribas

Moving Forward Applying Multilevel Governance Approach in Vocational Education and Training (VET) in the European Neighbourhood: three country examples in the ENPI South region

Abstract

This paper attempts to study the blurring distinction between TVET and academic Higher Education (HE) and the prerequisites to create stronger ties between these sectors by improving the chances of permeability and facilitating learning pathways.

Despite significant economic and social progress until date, high youth unemployment, social disparities and environmental degradations create challenges for all countries, which require the transformation of TVET through appropriate conceptualizations in the design of qualifications and their articulation within education and between education and the world of work. To address these economic, societal and personal developments and changes appropriately TVET graduates will have to acquire prospectively a holistic competence, whether this is related to work, education, citizenship or personal issues and which is expected to adapt to complex and unpredictable conditions. The authors assume that a consequently implemented shift to competence oriented learning outcomes, addressing both theoretical and practicable occupational requirements in the development of programmes and qualifications, will make the capability to act in TVET, across the education and training systems and the labour markets more explicit.

Knowledge-based jobs in the main occupational areas of manufacturing as well as primary and secondary service areas are increasing globally. They are also oriented to research and development and largely information-intensive have relied upon Science, Technology, Engineering and Mathematics (STEM) as foundation or basis for growth and innovation. Due to the increasing demand for systematized knowledge, exclusive work-based learning is more and more extended by institutionally theory-practice linked learning formats as apprenticeships combined with vocational school or college based education.

In the last few years TVET and academic HE are worldwide institutionally and conceptually converging because of similar economic and societal drivers in most of the countries. It has on the one hand necessitates appropriate systemic and conceptual adaptation of post-secondary education and on the other hand it demanded a practice orientation e.g. by the integration of work-based learning component in the H.E. program. Thus TVET is increasingly offered at higher level. Numerous programs have been developed in both initial and advanced TVET that contains elements of both vocational drift and academic drift in different forms to satisfy the emerging

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demand of labour market. The reforms and developments in post-secondary education indicate a blurring conceptual distinction between TVET and academic Higher Education. The ongoing debate in many countries on the pros and cons of an academization of TVET or a vocationalization of Higher Education can be interpreted as a converging trend to design education and training based on enforced theory-practice linkages on all levels of workforce and learner requirements and competences.

The authors assume that more qualification types and programmes with cross-sector doctrine and competence-compatible design of curricula and examinations will have to be designed and monitored, which address requirements of both the occupational labour market and the academic education at the same level. They conclude the discussed developments and demand generate a new space for TVET future by the fusion of academic drift in vocational program and vocational drift in academic program, which will reinforce solutions to promote permeability and mobility across education and occupational sectors.

1. The global context and the TVET¹⁰⁰ agenda

Our time is an era of transitions. This is also a time of turbulence as well as time of challenges. The challenges which threaten the economy, society and the environment are numerous, complex and interconnected. In spite of significant economic and social progress till date, high youth unemployment, social disparities and environmental degradations create challenges for all countries. These challenges threaten human security, dignity and social cohesion. Peace is fragile. Large number of people in this world still suffers from poverty, hunger and inequalities. Many targets of the Millennium Development Goals (MDG) remain big unfulfilled promises and need to be redefined in new and challenging environment of economic, social and environmental perspectives. Therefore a new vision for people, the planet, prosperity, peace and partnership has to be holistic, universal, rights-based and humanistic.

Global goals require global solidarity, international dialogue and an inter-sectoral, interdisciplinary approach as expressed in the commitment made at the United Nations Sustainable Development Summit 2015, 'Transforming our World: The 2030 Agenda for Sustainable Development'. The 2030 Agenda has 17 Sustainable Development Goals (SDGs), including SDG 4 which reads, 'To ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'. (cf. *United Nations 2015*)

Three targets are of special significance for Education and Training by 2030:

- ensure equal access for all women and men to affordable and quality technical vocational education and training and tertiary education, including university;

¹⁰⁰ Technical and vocational education and training (TVET) is understood as comprising education, training and skills development relating to a wide range of occupational fields, production, services and livelihoods. TVET, as part of lifelong learning, can take place at secondary, post-secondary and tertiary levels and includes work-based learning and continuing training and professional development which may lead to qualifications. TVET also includes a wide range of skills development opportunities attuned to national and local contexts. Learning to learn, the development of literacy and numeracy skills, transversal skills and citizenship skills are integral components of TVET (UNESCO 2015).

- substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs, entrepreneurship, societal participation and personal development;
- eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations.

Meeting these targets requires the transformation and expansion of TVET through appropriate conceptualizations in the design of qualifications and their articulation within education and between education and the world of work. TVET has a central role in helping youth and adults to develop the skills they need for employment, decent work and entrepreneurship, to support the effectiveness of their organizations and the development of their life and communities. TVET also contributes to promoting inclusive and sustainable economic growth, social equity and environmental sustainability. TVET contributes to gender equality, global citizenship education (GCE) and education for sustainable development (ESD). It is of high relevance to transform TVET in a way to maximize its potential to contribute to the achievement of global goals. Accordingly, it is a global task to follow each one of the 17 sustainable development goals (SDGs) including e.g. poverty alleviation and hunger, gender equality, good health, quality education, good decent jobs, renewable energy, fostering innovation and building infrastructure or actions towards the protection of the environment and social security & peace.

Figure 1: Focus Areas of the SDGs



These 17 SDGs are broken down into 169 targets which aim to realize inclusive and equitable economic, social and environmental sustainable development.

2. Transformative dimensions and concepts

Such holistic visions challenge TVET strategies require not only inclusive, equitable and relevant for the needs of work but also transformative and environmentally sustainable. Therefore, skills development and Technical Vocational Education and Training (TVET) being high on member states' policy agenda and so central to international debates, has never been so important and timely as now. It is now at the centre stage in the policy discourse and debate. A large number of member states are deeply engaging in reviewing TVET policies and repositioning its transformative dimension to meet the sustainability development goals (SDG). Following are the key elements of these transformative dimensions.

The most important effect of economic globalization on the modes of work has been manifested at the level of the organization of industrial production. The shift from mass production to a customized approach causes a fragmentation of value chains. A growing proportion of workers are employed in global value chains located in developing economies.

TVET graduates will have to acquire more than the technical Know How required in production but a range of soft skills e.g. the adaptability to constantly changing teams, work environments, communication skills and team work. This reflects a need for not just a more knowledgeable and skilled workforce, but on that can adapt quickly to new emerging technologies in a cycle of continuous learning. As a consequence, there is increasing demand for TVET systems with a greater focus on competence-based programmes as well as on cognitive and transferable skills, which are expected to help people adapt to complex and unpredictable conditions. (Majumdar 2004)

In addition the ICT based Industry 4.0 development will dramatically change company based organized production and service as transnationally operating value chains. The ICT use is required in a large variety of existing occupations, as well as an expansion of new occupations in the ICT sector. Last but not least the politically induced shift from carbon-intensive production and consumption to economies and societies consequent following sustainable development principles require increasingly green skills, changing skills profiles in existing occupations and the emergence of new occupations, with the introduction of new regulations. (Majumdar 2010)

To address these economic, societal and personal developments and changes appropriately TVET graduates will have to acquire prospectively a holistic competence, whether this is related to work, education, citizenship or personal issues.

2.1 Growing demand of STEM and other science related knowledge in occupations

Knowledge-based jobs in the main occupational areas of manufacturing as well as primary and secondary service areas are increasing globally (Raffe 2003). The policy debate has gained momentum due to the mere fact that today's global economy and society is driven by knowledge. The knowledge-based economy recognizes the key role of emerging technologies in providing a basis for the generation, management and utilization of knowledge as it has never been before. The major shift in emerging technology is dominated by the move from divergent to convergent technologies. Divergent technology had been earlier characterized as mono

discipline and more structured with limited fusion between different disciplines. In contrast, today's convergent technologies, including information & communication technology (ICT), bio technology, nano technology, energy technology, green technology, space technology, and entertainment technology etc., are interdisciplinary in nature and are a combination of more than one discipline. They are also oriented to research and development and largely information-intensive have relied upon Science, Technology, Engineering and Mathematics (STEM) as foundation or basis for growth and innovation. With these changes in technology, technical knowledge has raised more demands, requiring solid foundation skills on STEM. These skills include adaptability and learning to learn skills that make learners adapt to the fast changing occupational challenges. They are vital to building up the future skills profile of the people. Thus strengthening a strong STEM knowledge base needs greater adaptability and opportunities to develop trainable learners given fast changing technological changes. More and more complex equipment are expected to be used in all range of occupations, from construction to service sector.

This requires appropriate systemic and conceptual adaptations of education and training on all levels to address the needs of the societies, labor markets and the learners in terms of lifelong learning. In spite of the objective to match middle and advanced skills requirements of work-based settings, which increasingly have to be *underpinned* by science-related knowledge in some sectors (e.g., IT professionals), the majority of TVET based programmes and qualifications still match these specific requirements to a minor extent. And as a matter of fact, (trans)disciplinary knowledge, generic competences and methodological skills acquired in academic programmes are constantly demanded on the labour markets. Up to now it is often taken for granted in many countries that academic Higher Education plays a dominant role to match this knowledge-driven demand, because of its conceptual link to an ongoing research-based growth of scientific knowledge, which significantly contributes to innovations in all segments of society and economy. But TVET on higher levels exists worldwide in many variations in terms of system, institutional formation and conceptual approach as HE does. (Teichler 2003)

Designing, building, installation, operations and maintenance- type of jobs will demand medium to high level of STEM skills as occupations continue to be profiled or skills are standardized to meet broad-ranging tasks. The expansion of STEM in vocational education is therefore critical to meet jobs and give the workforce valuable STEM skills that correspond to the rising quality of jobs in key sectors. Increasing STEM in TVET will contribute to the conceptual change in the perception of TVET. The line between TVET and academic Higher Education is blurring and it is especially obvious in STEM fields. TVET qualifications increase the entry points to STEM jobs while these jobs are best filled by the workforce that possesses an adequate mix of STEM knowledge and practical skills. (Majumdar 2015)

On the one hand, the quality of TVET jobs is increasingly improved as the degree of STEM skills components changes in job profiles and open new pathways for vocational graduates. On the other hand, transformative dimensions and emerging concepts of work and education, competence and learning outcome and lifelong learning reinforces the emergence of higher VET and blurring the distinction between academic HE and post-secondary VET. The trend toward

higher qualification of skilled workers and managers promotes the discussion about the extent to which the vocational professionalization of this qualification can be designed along academic requirements in connection with higher education. In many countries, VET and HE institutions have different status, e.g. the scope, responsibilities and functions of competent institutions vary greatly when it comes to examination, recognition and the awarding of qualifications and certificates.

2.2 Importance of theory-practice linked education and training

Occupational learning in work-based environments is to increasing extent practiced in the industries of many countries worldwide compared to the still dominant formats of full-time vocational and technical education practiced in schools. Currently a quarter of students in upper secondary vocational education attend work-based programmes. Work-based learning refers to any form of learning for youth and adults that is implemented embedded in workplaces. Historically it has been predominantly developed as part of vocational training e.g. in apprenticeships in trades, but it can be practiced in many variations e.g. in internships. (Lerman & Rein 2015)

It is generally acknowledged that work-based learning can meet appropriately the education and training needs of the learners and the employers. It improves pedagogy and pathways to adulthood. It reduces costs and increases capacities of initial and continuing TVET. Due to the increasing demand for systematized knowledge exclusive work-based learning is more and more extended by institutionally integrated learning formats as apprenticeships combined with vocational school or college based education (*work to school*) or as company based internships of students at schools or colleges (*school to work*) e.g. in the US. Work-based learning is - still to minor extent - practiced in academic education. In recent years tertiary programmes have been consistently introduced combining academic studies with applied learning in the professional world. They are systematically practiced in cooperation predominantly with private companies. (Rein 2015)

Vocational Bachelor programmes have been developed and implemented in France and in Germany (*dual study*) combining theoretical studies with on-the-job training. Students alternate between university education and work-based learning, giving them the opportunity to apply concepts learnt in class to practice and vice-versa bring in new ideas from their work placements into the classroom. This provision of education and training at higher qualification levels includes employer involvement in curriculum development e.g. Denmark in the agricultural sector, work-based assignments and company based thesis works e.g. Germany and Ireland in innovation and technology management courses. This may be practiced in apprenticeships e.g. France in the agriculture sector and in UK-England in nursing and in teacher training. Since a long time Higher Education cooperative education in the US extend academic programmes on all graduation levels by academic external practical learning phases. In a format systematized way the Graduate School of Education at the University of California in Berkeley developed even a Ph.D. apprenticeship programme. (Lerman & Rein 2015)

Facing a trend to systematized theory-practice linked education and training on initial and continuing VET as well as in academic Higher Education the question may be raised whether the institutional differentiation between work to school or school to work describe sufficiently the phenomenon work-based learning. Furthermore it may be critically questioned whether the comprehension of practice and the acquired relevant competence should be better understand and operationalized independent from only one specific learning location e.g. the enterprise as it has been done up to now.

2.3 The shift from input to competences and learning outcomes

In the 90ies education research and practitioners as well as employers in many countries started to set the ability of learners to solve problems and to accomplish tasks in education and at the workplace in the center of any programme development in TVET. Learning is increasingly interpreted as an integral part both of adapting to changing circumstances and innovation as well as essential for personal development. The focus shifts from providers to users of education and training. It is also an effort to increase transparency and strengthen accountability of qualifications for the benefit of individual learners and employers. This does not mean that any education and training input like content communicated and acquired in programmes via curricula and appropriate didactic methodologies should be neglected but be regarded and applied as necessary prerequisites of the outcomes of learning. (Arnold & Müller 1993)

It is assumed that a consequent shift to competence oriented learning outcomes, addressing both theoretical and practicable occupational requirements in the development of programmes and qualifications, will make the *capability to act* in TVET, across the education and training systems and the labour markets more explicit. In terms of quality development of qualifications and programmes, this might be further promoted by theory-practice integrated learning outcome concepts facilitated by cooperating education providers and work place training providers like enterprises. (Breuer 2005)

Essential for any successful occupation provided by TVET is a provision of a profound basis of relevant technical knowledge and skills. Changing work environments, in addition lifelong learning, greening TVET, globalisation and other major drivers of transformation require domain independent transversal competences concerning cognitive, interpersonal and adaptability skills, attitudes, values and work habits to enable any successful transformational process and task accomplishments. (Rein 2012)

2.4 Transformational language in education and training

Since a long time TVET and other education and training systems and the labour market require the implementation of one comprehensive language to design programmes and to define assessment and quality worldwide. The concept of a shift to competence oriented learning outcomes is regarded to provide the potential for such an common language, making it easier to address the barriers between different education and training sectors and systems. This might facilitate transformational developments within and across education and training systems in many countries and sectors.

If lifelong learning is to become a reality, there is an urgent need to see how learning acquired in one setting can be combined with learning acquired in another. In a situation where lifetime jobs have become exceptions and where moving between work and learning has become a significant factor in most people's lives, learning outcomes may help to reduce barriers and build bridges. Major outcome oriented instruments and regulations for the transparency, the comparison and the recognition of prior learning like qualifications frameworks are already using a competence and learning outcome oriented language across the systems address this language need. (Bjornavold & Zahilas 2008)

3. Emerging trends in Post-Secondary Education: Some exemplary evidences

The increasing knowledge-based requirements in manufacturing and service areas in many countries require appropriate systemic and conceptual adaptations of postsecondary education and training to address the needs of the societies, labour markets and the learners in terms of lifelong learning (Raffe 2003). TVET is increasingly taking place at higher levels (e.g. EQF level 5 and more) and is growing in terms of enrolment in a number of programmes. An increasing demand of learners and employers has led to a booming development of post-secondary TVET qualifications (EU 2015). Demographic trends will have a direct impact on the size and orientation of education and training systems, the learner profiles and the design and delivery of programmes. Adults are staying longer in the labour market and need increasing flexibility from education and training institutions, to combine work and study in order to improve their career prospects or to change careers in later life.

In the last few years TVET and academic HE are worldwide institutionally and conceptually approaching because of similar economic and societal drivers in most of the countries. TVET and Higher Education institutions have different status, e.g. the scope, responsibilities and functions of competent institutions vary greatly when it comes to examination, recognition and the awarding of qualifications and certificates. Tertiary level TVET refers to programmes offered at the highest education levels outside formal academic higher education, whereas professional higher education e.g. study programmes in business administration, nursing, law and engineering are typically provided within the formal academic higher education. (Gerholz & Sloane 2008)

In recent years a number of programmes have been developed in both initial and advanced TVET that contains elements of both vocational drift and academic drift in different forms to satisfy the emerging demand of labour market. The quantitative development of these kinds of programmes largely reflected in ISCED 1997 Level 5 development. Although strictly speaking ISCED level-5 falls under tertiary education but researchers interpreted it as Tertiary TVET. It has been observed that ISCED 1997 does not have the level of detail required to reflect the tremendous diversity in TVET programme globally. According to the OECD survey conducted in 13 countries between the years 1995 and 2011 as per table below, the level 5 program has increased by 19% points in OECD countries and even in country like Switzerland, Germany, Austria, Czech Republic and Finland it has been recorded more than doubled.

(Hippach-Scheider 2016)

Table 1: Comparison of first degrees at ISCED levels 5A and 5B (1995 and 2011, in %)

Country (selection)	Tertiary A (first degree)		Tertiary B (first degree)	
	1995	2011	1995	2011
Ireland	30*	43	15*	22
Spain	24	32	2	18
Australia	36*	50**	Not specified	17
Switzerland	+	32	13	15
Germany	14	31***	13	14***
United Kingdom	42*	55	7*	13
Austria	10	35	Not specified	12
OECD average	20	39	11	11
Denmark	25	50	8	11
Czech Republic	13	41	6	5
Poland	34*	58	Not specified	1
The Netherlands	29	42	Not specified	0.5
Finland	21	47	34	0

* survey 2000; ** survey year 2010;
*** break in the statistical survey between 2008 and 2009 due to a changed allocation to ISCED 2 and ISCED 5B.

(OECD 2013)

To understand, the trend in proper context, it is required to look further the evolution of the ISCED level 5 programmes in some countries.

In **Finland**, tertiary education is separated between research oriented paths (Universities) and a more practice-oriented path (Universities of Applied Sciences, also called Polytechnics) in Finland. The educational programmes at the Polytechnics are allocated to ISCED level 5A although they are expressly assigned to the area of vocational education and training. The “polytechnics” are a relatively new educational institution in Finland. In 2013 there were 138,000 students at the polytechnics, compared to 167,000 students enrolled at universities at the same time. To make sure that the qualifications relate to the labour market and the regional demand for skilled labour and innovation in the desired way, practical phases are an obligatory part of the courses of study. (Hippach-Scheider 2016)

Similarly, in **Austria**, Universities offer degree programmes (Diplom Studiengänge) which offer two to three years of courses in artistic and vocational education and training. There are also vocational courses offered as a Bachelor's degree corresponding with a specific vocational area. There has been a significant increase in Level 5 A program in Austria and it is almost more than triple between the year 1995 to 2011 as per table.

Higher education programmes combining academic and vocational elements respectively theoretical and practical learning have evolved in the **Anglo-Saxon countries**, as well. A common feature of these countries is a very high proportion of graduates from ISCED 5A programmes (201): **Australia, 50%, UK 55%, Ireland 43%**. Short cycle tertiary education (ISCED 5) exist in both Higher Education and TVET. The "Diploma" is a qualification shared by both tracks. It leads to "Advanced Diploma" (TVET) or "Associate degree" (Higher Education). In **Australia**, the Associate Degrees (ISCED 5A) are understood to be both academically and vocationally qualifying and have been introduced as qualifications in recent years. They have been integrated into the Australian Qualifications Framework in 2004. The educational programmes leading to an associate degree are open to all those who have acquired a vocational qualification (certificates III or IV), as well. The programme duration is two years. Access to a bachelor degree programme is possible after completion; the bachelor course can be shortened through crediting regulations. Associate degree programmes are offered both by universities and by VET institutions such as the TAFE (Technical and Further Education). An intense nation-wide debate about the character of the associate degrees, which may also be described as a hybrid qualification due to the combination of academic/theoretical with specialized/practical content and elements of "work-based" learning, is currently underway (Smith 2013). To achieve this objective, so-called "dual sector universities" have emerged in Australia, some of them as successors of vocational colleges such as the Royal Melbourne Institute of Technology (RMIT) which has been granted the status of university in 1992. These "dual sector universities" offer educational programmes leading both to vocational qualifications and to academic degrees. Bachelor level (ISCED 6) exists in Higher education and TVET. Bachelor degree and Bachelor honours degree (A research-oriented bachelor degree, leading to Ph.D. curriculum) are provided by Higher education institutions only. Graduates of a Diploma (related to TVET or not), advanced diploma or associate degree can have up to two years equivalence, depending of the state credit system, the institution, and their previous qualifications. (Hippach-Scheider 2016)

The traditional binary divide, i.e. academic Higher Education offered by universities and higher professional education institutions is becoming more complex. In Norway nursing education is becoming part of academic Bachelor and Master Degree programs. The Polytechnics were reintegrated into the university sector in UK (England). Associate degrees in NL and degree apprenticeships in UK addressing EQF level 5 are on the rise during the last 20 years. The public regional dual Cooperative University in Germany design and provide Bachelor and Master programmes in cooperation with enterprises following the German dual apprenticeship format. In addition private sector providers to address this development at higher levels can also be identified in some countries (e.g. in Germany and in Ireland). Associate Degree programmes at level 5 of the European Qualifications Framework (EU 2008) are provided by Dutch higher professional education institutions. An increasing number of non-academic certificate

programmes become *embedded* in degree programmes. In the US community colleges integrate e.g. occupational certifications and apprenticeships in associate programmes since a long time. (Rein 2011)

In some of the countries in Asia like in **China**, the government is trying to develop a policy to establish good higher vocational college, by converting existing normal universities into Vocational Universities. “Gaozhi Higher Vocational Colleges” is the most equivalent type to the ISCED 5 and 6 levels. According to Ministry of Education (MoE) of China, it has been observed that the number of the higher vocational colleges in China was 1341 during 2015. There are about 747 specialized subjects offered by higher vocational colleges which require strong academic background, and 344 of the subjects are coherent with the bachelor education. Following the Chinese government’s policy of providing opportunities to students of secondary vocational schools to be able to pursue higher education (tertiary level) there has been an increasing number of Vocational Universities / Higher Vocational Colleges (see Table 2).

Table 2: Development of Higher Vocational Colleges in China with enrolment

Year	Number of Higher Vocational Colleges	Students enrolment of Higher Vocational Colleges (in 1000)
2015	1341	477
2014	1327	395
2013	1321	368
2012	1297	396
2011	1280	407
2010	1246	418
2009	1215	420

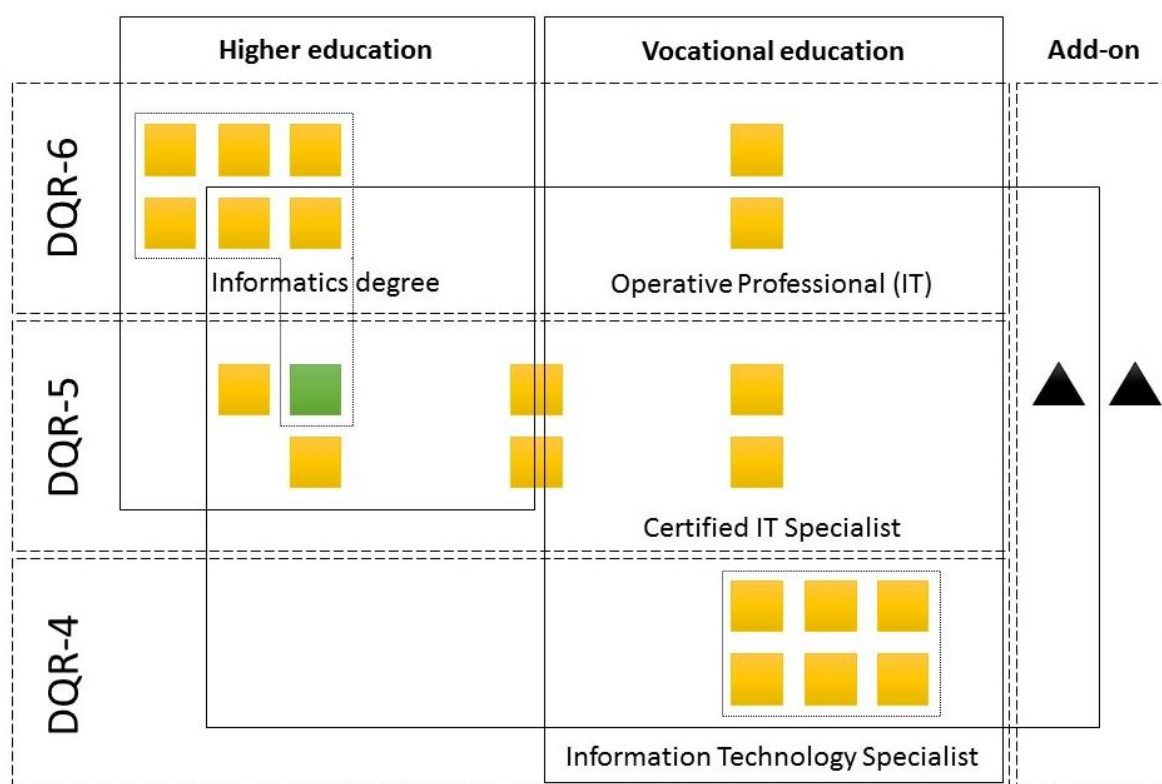
Source: http://www.moe.gov.cn/srcsite/A03/s180/moe_633/201607/t20160706_270976.html

Table 2 shows an increase of 126 in the number of Higher Vocational Colleges over last 6 years. The number of applicants who went on to vocational university or college has stay 42%-43% before 2009. And then it decreased continuously to 36.8% in 2013. However, there has been an increasing ratio of applicants for vocational schools as a result of government policies that facilitate students’ move from general education schools to vocational schools from 2014. China’s policies for vocational education converging with higher education program apparently have considerably improved its image in the public perception. Similarly, in terms of gender differences the statistics show that women score better in exams than boys.

In **Germany**, there is a movement to build bridges between higher and vocational education through cross cutting education program in IT occupations in particular. It has been observed

that DQR Bridge 5 project is developing cross-cutting education measures at Level 5 of the German Qualification Framework (BMBF&KMK 2011) for which credit transfer can be granted within the framework of an upgrading training program and a Bachelor's degree program. The Federal Government funded project "Promoting permeability to produce skilled workers – developing cross-cutting education and training measures in Higher and Vocational Education at level 5 of the German Qualifications Framework" is exploring the potentials of this Qualifications Framework level (BIBB 2016). In cooperation between VE and training providers, chamber organisations and higher education institutions with academic backup, interlocking forms of curricula provision are being developed which are valid for both sectors of education and training, i.e. as the first tier of upgrading training and also eligible for credit towards a degree. The educational and training provision is coupled with advisory measures which are, in turn, being developed and realised across educational sectors. The models are being developed in the DQR Bridge project for the Information Technology sector among others. The design of education and training measures across educational sectors can combine learning outcome units from different sectors of education, e.g. modules from degree programme, units of learning outcomes from advanced vocational training and qualifications such as a recognised initial occupational qualification. In the figure below the cross cutting learning arrangement between TVET and H.E in the IT sector are shown in Figure 2.

Figure 2: Cross-cutting learning arrangement in the IT sector



In the figure, units of learning outcomes are shown as squares; qualifications are represented by outlined units of learning outcomes, and triangles stand for the add-ons which are explained

further below. In this respect, courses taught across educational sectors represent flexible structures. An individual assemblage of units of learning outcomes, qualifications and add-ons is denoted by the part of the diagram shaded in light blue. The individual provision represented by the light blue area contains a “complete” qualification from VE and training - The initial vocational qualification as an IT Specialist (“Fachinformatiker”). A higher education qualification – a degree in Informatics at Bachelor’s level – is only partially integrated in this case. Cross-cutting courses may combine higher education degree programmes or certificate courses, but also other modules; bridging courses, for example. Add-ons are additional elements which increase the attractiveness of the learning arrangements, for example, the prospect of taking over a skilled crafts enterprise. (Hemkes et al. 2015)

All these trends in different countries are showing that a growing evidence of developing higher VET programs and wide range of models to create stronger links between academic, professional and practice related learning. In the subsequent section we have made further analysis in terms of implication and lesson learned from these trends.

4. The blurring conceptual distinction between TVET and academic Education

The reforms and developments in post-secondary education indicate a blurring conceptual distinction between TVET and academic Higher Education. The ongoing debate in many countries on the pros and cons of an *academization* of TVET or a *vocationalization* of Higher Education can be interpreted as a converging trend to design education and training based on enforced theory-practice linkages on all levels of workforce and learner requirements and competences. In both TVET and academic Education there is a potentially compatible competence-related orientation for the design of educational pathways and qualifications evident, both implicit, and, to some extent, explicit. This inherent conceptual intersection of the educational approaches in the qualification goal of acquiring competence as capability to act represents a considerable prerequisite for the design of the permeability of educational pathways between vocational and higher education. (Rein 2012)

However the traditional focus on the labour market as *the exclusive* empirical basis to identify required competences for qualifications on higher levels with more complex requirement structures is not sufficient to design academic and advanced non-academic qualifications concerning the following aspects. Due to the dynamic development of research based knowledge academic Higher Education is directly involved in education and training programme developments. Furthermore it indirectly provides inputs e.g. via benchmarks even used in general secondary education and identifies and defines labour market requirements and competences (technical and transversal) inside and outside the academia, because it is an essential part of the economic and societal value production und innovation. This extended comprehension of academic Higher Education matches as well the ongoing convergence trend between the education and training systems. In addition it has to be stressed from a holistic education point of view that both VET and academic qualifications have to meet in many countries not only technical professional requirements but also societal and personal requirements, as it is legally established in their education acts. (Rein 2015b)

It is assumed that a consequent shift to learning outcomes, addressing compatibly both academic and occupational requirements in the development of qualifications, will make the *capability to act* across the education and training systems more explicit. Consequently, this will facilitate the visibility of the intersection and compatibility of Vocational and Higher Education approaches. In terms of quality development of qualifications and programmes, this might be further promoted by integrated learning outcome concepts based on theory-practice linkages in 'traditional' degree programmes as well as in *embedded* degree programmes which integrate academic and work based learning in an adapted way e.g. as *dual study*.

Comprehensive and sector-based qualifications frameworks already established on national and regional levels play a major role as reference instruments for the transparency and comparability of both academic and TVET qualifications worldwide. Being essential instrumental parts of the conceptual shift to learning outcomes in education and training qualifications frameworks, will continue to play an increasing role as catalyst to promote conceptual compatibility and the development of a common language in education and training. The currently developed World Reference Levels for a global zone of mutual trust between TVET and academic Higher Education will have to take into account these considerations discussed in this paper to promote an improved link between the two education systems. (Chakroun & Keevy 2015)

More qualification types and programmes with cross-sector doctrine and competence-compatible design of curricula and examinations will have to be designed and monitored, which address requirements of both the occupational labour market and the academic education and career pathways at the same level. Recent research on theory–practice integrated curricula in traditional and in embedded degree programmes (e.g. dual or short cycle) has confirmed the promising development potential of these qualification formats for cross-sector and action-oriented learning promoted by a consequent the shift to *learning outcomes*. (Rein 2015 b)

A *central question* for further considerations is how this objective can be achieved in the design and development of qualifications while avoiding a loss of education system characteristic and identity or even a convergence to facilitate permeability and seamless pathways to match evident economic and societal demands.

5. Way forward: A new space for TVET Future!

Advanced vocational education and training and professional higher education are very dynamic e.g. in Europe and the recent years have shown important developments in both types of programmes. It has been observed that world wide TVET programmes are 'upgraded' to higher professional education in occupational fields like IT, education, health and social work (Smeby et al. 2014). Considering the shift in demand for skills towards higher levels of qualifications, there will be a need to upgrade VET provision to higher levels in some professions. Almost half of all job openings (including both new and replacement jobs) in the EU by 2015 will require "high level"/"high-end" skills (Cedefop 2014). This 'upgrading' tendency can be interpreted as an 'academic drift' which can change the institutional and the content-character of a programme and a qualification.

In Europe, new VET programme provision is steadily expanding at EQF levels 5 to 8, and traditional HE institutions providing higher professional education programmes, are currently central to the EU efforts on employability and economic growth. In many cases academisation of VET can currently be observed in growing number of ISCED 5A programmes in different countries and region of the world. A recent study also looked in greater depth at 10 higher VET programmes or qualifications through case studies conducted by EU Directorate. The study was conducted to understand the extent to which higher VET is developed across all EU countries. The study also reconfirms the growing expansion of vocational programs beyond EQF level-5 in most of the EU countries. In terms of levels, the cases studied focused on either one EQF level – EQF 5 (Finland, Italy, Portugal) or EQF 6 (Sweden), EQF 5-7 (France), EQF 6-7 (Poland) and EQF 5-8 (UK, Northern Ireland). Attached annexure gives an overview of the 10 case studies (EU 2015). The case studies were based on desk research and interviews. The researchers carried out in total 71 interviews for the 10 case studies.

To promote Higher VET within the tertiary sector the European Commission proposes three models: parallel track to academic education, HVET as one of the two segments of academic HE within the three-degree cycles of the European Higher Education Area framework and at last HVET qualifications could be part of Adult Learning and Continuous VET (EUCOM 2016). In terms of bridging HVET and academic HE to promote cross sector education paths UNESCO stresses the demand to develop sustainable and practicable procedures of articulations aligned to national qualifications frameworks which had been developed and implemented in most of the countries (UNESCO 2016).

On the other hand, in recent years it has been observed the introduction of tertiary program deliberately combining with academic studies with more practical and applied sciences offered in cooperation with enterprises. These kinds of programs are developed to minimize apparent mismatch between tertiary qualification and the demand of labour market. This opposite trends which can be termed as vocational drift in tertiary education, are observed in many countries of Europe including Germany, Finland and Austria as well as in China. As is the case in the German Vocational Academies, learners alternate between university education and on-the-job training, giving them the opportunity to apply concepts learnt in class to practice and vice-versa bring in new ideas from their work placements into the classroom. Resulting from increased cooperation between higher education and businesses, this 'vocational drift' can be identified in an increasing number of countries (e.g. in the EU), promoting the combination of theoretical and practical learning as a major strength for tertiary institutions.

The trends discussed above have generated a new space for VET future by the fusion of academic drift in vocational program and vocational drift in academic program. According to Raffae (2003), a drift can take many forms. However, it can be distinguished in three major forms of perspectives, content, longitudinal and integrated. The outcome of these approaches will reinforce solutions that promote permeability and mobility across education and occupational sectors. In turn, it provides more options and informed choices to the learners in selecting career and occupations across jobs.

The challenge for any TVET credentialing processes is not only to match a specific educational and occupational demand. In terms of a new lifelong learning continuum within TVET and across the systems it has to be safeguarded that any revised or new credential is connectible to others, to pathways across postsecondary education and training systems and matches acknowledged quality standards. Again, a consequent shift to competence oriented learning outcomes facilitated by transparency instruments like qualifications frameworks, aligned with recognition of prior learning regulations and credit transfer systems will promote such a development. Credential types and programmes with a competence-compatible design of curricula and assessments are promising, which address requirements of both the occupational labour market and academic education and career pathways at the same level. If the conceptual differences between tertiary education sub-sectors are considered to be limited, or of limited relevance from the perspective of the development of effective knowledge policies that include tertiary level VET, what is the rationale for treating tertiary level VET as a separate policy area. Will a converging part between vocational and professional education emerge without catching up with the traditional part of academic Higher Education? A further question is whether an occupational-oriented academic Hybrid-Sector could generate a greater dynamic, if it is not incorporated in the regulatory Higher Education system and in the vocational education at the same time. Does an educational hybrid-sector and its specific programmes and qualifications need an independent regulation system?

This paper attempted to study the above trends, to create stronger ties between TVET and academic HE by improving the chances of permeability, facilitating learning pathways and more and more blurring the distinction between H.E and Higher VET. However any substantial decision making process demand further insights on this matter with increasing priority

- to collect more evidences and conduct more researches to highlights its importance,
- to strive for broader agreements among member states in defining structure of post-secondary TVET qualifications and
- to improve the parameter of articulation between TVET and academic Higher Education
- to investigate the nature of academic drift in the post-secondary VET terms of the content and the didactics to justify the upgradation in substance.

Thus, by commissioning studies it can further reconfirm the great opportunities and potential for TVET to develop at higher qualification levels EQF level 5 and above in converging directions. Such VET at higher qualifications will help to overcome the age-old stigma of TVET unattractiveness by providing more learning pathways to the graduates in selecting career and occupations. Above developments generate a new space for TVET future by the fusion of academic drift in vocational programmes and vocational drift in academic programmes, which will reinforce solutions to promote permeability and mobility across education and occupational sectors.

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