

# Challenges and Opportunities for Technical and Vocational Education and Training in the local communities: Education and Labour Market for Young People

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## Abstract

A country's competitiveness in the global economy depends on its ability to develop a knowledge-based economy. EU has emphasized the importance of education and training systems for the knowledge society. The paper aims to contribute to the debate on vocational education, and specifically to the literatures on varieties of workforce development, human capital, labour market and social cohesion. Findings reveal that education is considered vital for the formation of a skilled and knowledge-able pool of workers. Investments in vocational and technical skills can be an important factor in contributing to economic development. Nevertheless, social cohesion depends on the way in which education and the labour market are linked. The contribution of this paper is to assess the policy strategies dealing with local youngsters' education, labour market demands and social cohesion with respect to their potential of enabling young people to participate in working life and society. It also offers a contribution to the growing field of political economy of the link between labour market and social cohesion, the variation and dynamics of education systems, and globalisation.

**Keywords:** vocational education, human capital, labour market, social cohesion

## 1. Introduction

### 1.1 Skill-Biased Technological Change and Human Capital

As globalization reshapes the international economic landscape and technological change creates greater uncertainty, the demand for high-skilled workers has grown, and entrepreneurship helps to meet the economic and social challenges. (Lucie Cerna, 2016; Maria Rosário Cabrita, Cristina Cabrita, Florinda Matos, & María del Pilar Muñoz Dueñas, 2015) Responding to the persisting economic stagnation and to the new competitiveness challenge, Regine Schröer (2015) launches the goals of the dynamic knowledge-based economy, capable of sustainable economic growth and greater social cohesion, and stresses the need to invest in human capital and to accompany them with active labour-market measures. Daniele Morselli (2015) claims the need to incorporate innovation and entrepreneurial attitudes is underlined in initiatives, and Daniel Araya (2015) advocates the redesign of schooling in correspondence to advancing technologies. One of aims of this paper is to use a local dataset to test whether the idea can be validated or whether structural differences persist, or to get the plurality of models for the local communities.

Today, mounting demand to augment human capital for knowledge economy has triggered a wide-ranging debate. (Daniel Araya, 2015) Rocío Aliaga-Isla (2015) assumes human capital is important because it is the assets that individuals acquired through their investment in schooling and on the job. Margarita Pavlova and Rupert Maclean (2013) consider the human resource development influenced the reorientation of secondary and higher education towards individuals' employability to achieve development goals. Human capital arises from three sources: education, training and, perhaps most important for entrepreneurship. (Rui Baptista and João Leitão, 2015; Aurora A. C. Teixeira and Ricardo Castro, 2015) Modernizing economies are concerned with upskilling their workforce to meet the demands of knowledge-intensive and high-technology industries. (Shanti Jagannathan, 2013) The technology in the local communities, Taiwan is close to the global cutting edge in many areas such as electronics and information technology, services, communications, pharmaceuticals, and biotechnology. As the local economies move away from low-cost labor advantages in manufacturing toward knowledge- and technology-intensive industries, the quality of the human resource

is crucial for competitive strength. One of aims of this paper is to understand the drivers for workforce development come from the convergence of the interrelated factors in the local communities, Taiwan: skill-biased technological change (SBTC), knowledge economy and demographic shifts.

The Lisbon objectives stresses the importance of raising the qualification level of the working population, on account of both competitiveness and entrepreneurship, and the European Union emphasizes the importance of education and training systems for the knowledge society. (Jeroen Onstenk and Ruud Duvekot, 2017; Audrey Dumas, Philippe M éhaut & No émie Olympio, 2013) Holger Ziegler, Thierry Berthet , Roland Atzm üller, Jean-Michel Bonvin, and Christian Christrup Kjeldsen (2015) and Dirk Michel-Schertges (2015) consider the strategies of education, labour market and social policy emphasise the necessity to promote skills and competencies of young people. Daniel Araya (2015) believes education is seen as a vehicle of national competitiveness. Jeroen Onstenk (2014) shows technical and vocational education and training (TVET) is important because a country cannot achieve economic and social development without a productive labour force. The diversity of individual trajectories depends on the level of education and vocational training achieved. (Marion Lambert, Josiane Vero, Hans Ekbrand, and Bj örn Haller öd, 2015) It is a complicated topic because of the changing economic and labour market contexts. TVET is regarded as important to achieving relevant and high-quality education for all. (Rupert Maclean, Shanti Jagannathan, and Jouko Sarvi, 2013) In order to promote the development of education and labour market for young people, it deserves us to do this study.

### *1.2 Education and Labour Market for Young People*

The young generation is better educated and possesses more human capital than ever, but the young people find it increasingly difficult to get a job and support themselves. (David Cairns, Valentina Cuzzocrea, Daniel Briggs & Lu ía Veloso, 2017; Bj örn Haller öd & Hans Ekbrand, 2015) Marion Lambert, Josiane Vero, Hans Ekbrand, and Bj örn Haller öd (2015) mention the transfer of responsibilities that matches with both trends of the development of a knowledge society and the promotion of employability strategies lies on the individual. Holger Ziegler, Thierry Berthet , Roland Atzm üller, Jean-Michel Bonvin, and Christian Christrup Kjeldsen (2015) argue such strategies have to be able to deal with labour market demands and need to be focused on the capabilities of young people to shape their lives and to cope with economic, demographic and skill-biased technological challenges. Regine Schr öer (2015) indicates what we want to see is if involvements allow new education and employment opportunities and if they foster the development of the skills and capabilities young people need to cope with the challenges linked with the transition to work. It seems to be obvious that the development of strategies for enhancing the social sustainability is still an unfinished task. Therefore it deserves us to investigate the link between young people's education and their labour market-related position.

A country's competitiveness crucially depends on its ability to develop a knowledge-based economy, and education is considered vital for the formation of a skilled and knowledge-able pool of workers. Jan Germen Janmaat, Marie Duru-Bellat, Andy Green and Philippe M éhaut (2013) emphasize education cuts both ways, fostering both economic competitiveness and social cohesion, so that raising the level of education should be a national priority. David Cairns, Valentina Cuzzocrea, Daniel Briggs and Lu ía Veloso (2017) also stress the desire to improve young peoples' access to education and to maximize the value of their educational experience is prominent. Marie Duru-Bellat, Antoine V é éout and Francois Dubet (2013) assume the impact of education on social cohesion depends on the socialisation produced by education and its relations with employment. Regine Schr öer (2015) recognizes that a knowledge-based society generates needs in terms of social cohesion which education and training can make a significant contribution. Social cohesion is determined by a whole range of factors including socio-economic factors. Education and labour-market regimes vary widely within the local communities according to the specific socioeconomic and political background. There are still controversies in educational research, particularly regarding the link between education and social cohesion. One of the objectives of this paper is to advance our knowledge of how these facets of education, including its link with the labour market, contribute to or undermine social cohesion.

Education is a public good, and investments in human capital are seen as key to mitigating skill-biased technological change. (David Cairns, Valentina Cuzzocrea, Daniel Briggs & Lu ía Veloso, 2017; Daniel Araya, 2015). Margarita Pavlova and Rupert Maclean (2013) point out the transformation of societies has changed perspectives on the need for vocational skills. The local communities, Taiwan includes the vocationalisation of both secondary and tertiary education in its educational policy agendas, considering the close correlation between upper-secondary TVET enrolments and its GDP. Recognizing the importance of the global economy in shaping education, it is interesting in developing a new framework for rethinking educational reform. One of the purposes of this paper is to rethink the educational reform in light of emergent changes in economy and society. Research issues have been changing in response to changes in societal and labour market demands made to TVET. These changes could be summarized as a multi-level transformation process of manpower demand towards more open approaches.

### 1.3 Theoretical Foundations

The need for highly skilled labor and the importance of information and communication technologies (ICTs) are categorized the main features of knowledge economy by the OECD. (Daniel Araya, 2015) Daniel Araya (2015) advocates the diffusion of ICTs has intensified skill-biased technological change, and the economic strategies need to be focused on long-term investments that promote skilled autonomy and creative practice. Maria Ros ário Cabrita, Cristina Cabrita, Florinda Matos, and Mar á del Pilar Mu ñoz Due ñas (2015) refer the knowledge-based economy calls for a better understanding of how firms, universities, and government institutions interact to accrue economic growth. Aurora A. C. Teixeira and Ricardo Castro (2015) describe entrepreneurs with advanced technological expertise are likely to possess knowledge generated by R&D. Regine Schr öer (2015) indicates the increased competition on labour markets and the shift towards the knowledge society have increased the importance of education on the labour market. Therefore, Daniele Morselli (2015) assumes that innovation and entrepreneurship provide a way forward for solving the global challenges. Entrepreneurship should be a core component of vocational education and training and entrepreneurship education is a necessary component for a successful transition from school to work.

Lucie Cerna (2016) argues the competition for global talent has become one of the key policy priorities as countries seek to respond to challenges posed by ageing populations, decreasing human capital, competitiveness and economic growth. Daniel Araya (2015) recommends openness to diversity facilitates the absorptive capacity for importing the necessary skills for economic expansion. Eissa Alrumaithi, Maribel Guerrero, and I ñaki Pe ña (2015) , Maria Ros ário Cabrita, Cristina Cabrita, Florinda Matos, and Mar á del Pilar Mu ñoz Due ñas (2015), and Roc ó Aliaga-Isla (2015) mention that human capital comprised of education, experience and skills plays a vital role in the entrepreneurial process, and that individuals acquire human capital through investments in schooling and on-the-job training. Daniel Araya (2015) emphasizes education is regarded as a feature of discussions on market growth and the refinement of human resources. Eissa Alrumaithi, Maribel Guerrero, and I ñaki Pe ña (2015) assume higher education has a positive impact on entrepreneurial activities. In order to remain competitive and survive in a globalised economy. Tom Short and Roger Harris (2014) insist organisations have been compelled to evaluate the benefits of workforce development projects. Companies should have an economic incentive to invest in human capital. (Aurora A. C. Teixeira and Ricardo Castro, 2015) More human capital is better because it can influence individuals in the choice of careers or even in attitudes towards engaging themselves in entrepreneurial activities. (Roc ó Aliaga-Isla, 2015)

Jeroen Onstenk and Ruud Duvekot (2017) mention technological developments, dynamics of labour markets, and globalization, all reinforce the need for further training for workers. The OECD defines vocational education and training (VET) as . . . designed for a type of job. It includes many upper secondary and tertiary programmes. (Kathrin Höckel, 2012) The World Bank highlights the importance of skills for individuals and economies as skills are at the core of improving individuals' employment outcomes and increasing countries' productivity and growth. (Rupert Maclean, Shanti Jagannathan, and Jouko Sarvi, 2013) Based on Marie Duru-Bellat, Antoine V é éout and Francois Dubet (2013), societies may be said to assign their members to specific positions through two key processes: firstly, the assignment of individuals to an educational track and career, secondly, the assignment of individuals to specific social positions on the basis of their previous educational career. Marc van der Meer, Jan Peter van den Toren, and Tammy Lie (2017) point out the ambition of the vocational education is drafted the threefold: to train youngsters for a job, to prepare them for further study and to socialise them as members of society. Approaches range from well-established apprenticeship systems to school-based forms of provision. (Kathrin Höckel, 2012).

In the context of rapid technological change and globalization, priority has been to improve labour market prospects for the low-skilled. Better integration of youth into the labour market is viewed as key issues (Rupert Maclean, Shanti Jagannathan, and Jouko Sarvi, 2013). Ute Clement (2012) considers TVET is meant to integrate young people into the labour market and to offer educational opportunities for those who could not benefit from higher education. TVET is the right vehicle for providing skills to those who would otherwise lack qualifications and ensuring their inclusion into the labour market (Kathrin Höckel, 2012). Seung Il Na (2014) suggests an integrated track grants bachelor's degree and certification within a university program, and an accelerated track allows students to apply for the bachelor's degree after accumulating field experiences. Felix Rauner (2012) insists the societal, political and economic interest in permeability between vocational and academic education. Initiatives such as those for "Science, Technology, Engineering and Mathematics" (STEM) education are beginning to involve TVET. In addition, organizations and professional industry associations have supported TVET initiatives. (Christopher Zirkle and Lindsey Martin, 2012) Rupert Maclean, Shanti Jagannathan, and Jouko Sarvi (2013) maintain TVET can play an essential role in promoting sustainable poverty alleviation, human development and economic growth. Margarita Pavlova and Rupert Maclean (2013) also believe the social role of TVET is to promote the social inclusion of less privileged groups in education and training, to narrow educational gaps and to avoid social fragmentation. The massification and diversification of secondary education and the expansion of access to vocational and technical education have helped to retain more students in school.

### *1.4 Aims & Underlying Assumptions*

This paper contributes to the literature on the role education plays in local development, and develops a framework that links education and labour market, where the social cohesion perspective provides an approach of the knowledge-based entrepreneurial activity. The paper is organized as follows: Section 1 develops the theoretical underpinnings, drawn from the literature on technical and vocational education and training, human capital, labour market and social cohesion. Section 2 presents the methodology and technique used for data analysis. Section 3 is devoted to empirical findings that refer to the analysis, main results, and discussion. Finally, is dedicated to present implications and future research lines that the paper concludes and presents limitations, implications for policy-makers engaged in educational reform oriented to create innovation. This paper assesses the policy strategies dealing with local youngsters' education, labour market demands and social cohesion with respect to their potential of enabling young people to participate in working life and society. We are interested to develop policy proposals for rethinking education policy. Moreover, we wish to build on alternative readings of knowledge economy to highlight the need for a new policy framework in shaping education.

The paper analyses the ways economic competitiveness is viewed in relation to human resource development and some implications for vocationalisation. The development of employability skills within the inclusion of general education in TVET programmes can be viewed as being amongst the directions for the vocationalisation of schooling. The paper mainly investigated local policies in Taiwan surveying whether and how the match between young people's supply of skills and changing labour-market needs is sustained and secured, while broadening their options for living in and actively shaping Taiwan knowledge societies. It has explored how educational strategies are implemented and assessed and if they enable young people to convert knowledge and skills into capabilities to act as participating active citizens. We try to describe the necessary substantial shift of the policy strategies, developed by Taiwan, to bring the focus on the individual needs of youth at risk of social and labour-market exclusion. We acknowledge the importance of the empowerment of young people as a key issue to facilitate the transition from school to work and adult life.

## **2. Method**

The analysis combines quantitative and qualitative data, as well as different kinds of evidence (e.g., official documents, media coverage, scholarly and policy analyses). They provide preliminary evidence for correlating the explanatory variables (human capital, labour market and social cohesion) with the openness of education policy. The qualitative section attempts to provide a high degree of causal complexity and theoretical sophistication through knowledge and analysis of the issues. The data are aggregated to produce national indices (e.g. labour market index, education index). This paper utilizes official documents and public policy to generate both analysis and recommendations regarding educational policy processes in Taiwan. The data used in this study comes from the database "Directorate General of Budget, Accounting and Statistics (DGBAS)", "Workforce Development Agency, Ministry of Labor (MOL)" and "Ministry of Education (MOE)", provided by the Executive Yuan, R.O.C. Taiwan. This database provides information about employment and education. Document review and analysis have been used as the foundation for data collection and the documents used in the study have been selected as key illustrations of the nature and goals of educational reform policy.

The variable is based on two aggregate variables: the impact of education on employment measured by the employment rate of higher education graduates compared to the employment rate of individuals with a qualification below upper secondary education; and the impact of education on wage levels measured by the average wage of individuals with a tertiary education compared to the average wage of individuals with a qualification below upper secondary education. It draws on an innovative combination of qualitative and quantitative research methods to develop a deeper understanding of issues significant for young people who are making the transition between TVET and higher education (HE), and relevant for the wider policy debate on widening participation in HE. Indicators reflecting macro-economic context of the local communities are taken into account; they include population and ageing, labor force participation rate, unemployment/employment rate, educational attainment, earnings and salary, educational expenditure and the share of GDP. These indicators reflect the degree of social cohesion in the local communities. This reflects the notion that some individuals' labour market situation does not accord with the relationship between education level and level of job. Taking these indicators into account is all the more important since they help to define the cultural and political contexts that obviously affect social cohesion.

## **3. Results**

Taiwan is experiencing the challenges of rapid development, structural reform and high levels of labour mobility. Successive policy papers and statements increasingly emphasize the need to enhance the competitiveness of the economy, its transformation into a knowledge economy, and the need for a well-educated workforce responsible for and able to manage its own employability. These can only be met through flexible education and training systems with efficient skills recognition processes. From the 2000s onwards, high levels of unemployment and cuts in public

expenditure led the government to redirect education policy towards its economic functions, with an emphasis on vocational education and training. It is necessary to reduce the high levels of unemployment, especially among young people and the structurally unemployed, and to raise levels of active participation in the labour market. Education and training are increasingly seen as instruments for the acquisition of starting qualifications in order to secure (re-)entry into the labour market. Publicly-financed provision of adult education is extended from the second chance provision of general education for educationally disadvantaged groups to include adult vocational education and training for (re)integration in the labour market.

### 3.1 Population

The number of population in Taiwan in 2018 is 23,425,000, and the proportion of “Civilian Population Aged 15 Years & Over to Total Population” develops from 81.30 in 2008 to 85.93 in 2018, which is shown in Table 1. Then the index(%) of ageing develops from 61.5 in 2008 to 80.5 in 2013; the amount(‰) of population annual increase rate declines from 3.4 in 2008 to 2.5 in 2013; the number of projections - total population declines from 23,559,000 in 2020 to 23,192,000 in 2032, and then 20,414,000 in 2050, which is shown in Table 2. Taiwan faces ageing populations and sees declining populations as well. Demographic change is usually perceived as a challenge for societies because inherited social structures tend to become inadequate for populations changing in size or age composition. These population trends are expected to raise public expenditure for pensions, health and care whereas demands for education expenditure and unemployment benefits might decline.

Table 1. Major Indicators Based on Manpower Survey Results in Taiwan, End of 2008—2018

number year	Population (1000 Persons)	Proportion of Civilian Population Aged 15 Years & Over to Total Population (%)	Labor Force Participation Rate (%)	Unemployment Rate (%)
2008	22905	81.30	58.28	4.14
2009	22977	82.06	57.90	5.85
2010	23036	82.75	58.07	5.21
2011	23077	83.43	58.17	4.39
2012	23148	83.97	58.35	4.24
2013	23218	84.36	58.43	4.18
2014	23262	84.71	58.54	3.96
2015	23319	85.09	58.65	3.78
2016	23364	85.44	58.75	3.92
2017	23404	85.66	58.83	3.76
2018	23425	85.93	58.99	3.71

Source: Directorate General of Budget, Accounting and Statistics (DGBAS) of Executive Yuan, R.O.C. (Taiwan)

Table 2. Population in Taiwan

year	Index of ageing (Units:%)	Population annual increase rate (Units:‰)	Population Projections-- Total population	
			year	Number(Units:1000)
2008	61.5	3.4	2020	23559
2009	65.1	3.6	2026	23497
2010	68.6	1.8	2032	23192
2011	72.2	2.7	2041	22111
2012	76.2	3.9	2050	20414
2013	80.5	2.5	2061	17952

Source: Directorate General of Budget, Accounting and Statistics (DGBAS) of Executive Yuan, R.O.C. (Taiwan)

### 3.2 Employment and Age

Of Taiwan’s current population, 18.58% is 15- 29 years, which is shown in Table 3. The percentages of employment by age 15~19 years and age 20~24 years are 8.51 and 49.66 respectively; the percentages of unemployment by age 15~19 years and age 20~24 years are 8.46 and 11.98 respectively; and the labor force participation rate age 15~19 years and age 20~24 years are 9.30 and 56.43 respectively. Taiwan has nearly 203,000 young people (15~29 years) unemployed and 2,190,000 young people(15~29 years) employed. Taiwan with a youthful demographic profile needs to consider strategies that would improve job prospects for young people. The young people must improve skills and increase prospects of better-quality jobs to know well the chance of joining this dynamic economic workforce. Although young people have been progressively shrinking in number and becoming more educated, they are experiencing difficult transitions into the job market: in 2018, 112 thousand youths aged from 15 to 24 were unemployed. Young people face high unemployment rates and are increasingly affected by long-term unemployment as well as labour market segmentation, such as the increased probability of future unemployment, the reduced level of future earnings and the higher probability of working in an unstable job.

Table 3. Population and Employment by Age in Taiwan in 2018

by Age	Civilian Population aged 15 years & over	Proportion of Civilian Population Aged 15 Years & Over to Total Population (%)	Employment		Unemployment		Labor Force Participation Rate (Unit:%)
			Number	%	Number	%	
Total	20129	85.93	11434	66.40	440	3.71	58.99
15~19 years	1327	5.66	113	8.51	10	8.46	9.30
20~24 years	1505	6.42	747	49.66	102	11.98	56.43
25~29 years	1522	6.50	1330	87.43	91	6.37	93.39
30~34 years	1620	6.92	1439	88.82	50	3.39	91.93
35~39 years	1991	8.50	1676	84.16	58	3.37	87.10
40~44 years	1860	7.94	1529	82.19	40	2.56	84.34
45~49 years	1782	7.61	1464	82.12	33	2.20	83.96
50~54 years	1812	7.74	1305	72.04	27	2.03	73.54
55~59 years	1791	7.65	979	54.69	17	1.68	55.63
60~64 years	1589	6.78	572	35.98	11	1.97	36.70
65 years & over	3331	14.22	280	-	0	0.14	8.43

Source: Directorate General of Budget, Accounting and Statistics (DGBAS), and Ministry of Education of Executive Yuan, R.O.C. (Taiwan)

Unit: Thousand Persons, %

### 3.3 Labor Force and Educational Attainment

As economic growth in Taiwan slows, unemployment among the 15–24 age group in Taiwan is on the increase, particularly for those with no or low levels of training. Youth unemployment rates are higher than the average unemployment rates in Taiwan, which has been noticed as early as the late 2000s to the early 2010s. Table 1 provides 2008–2018 data of youth unemployment rate for Taiwan that the number declines from 5.85 in 2009 to 3.71 in 2018. In order to retain employability and competitiveness, youth continue in the pursuit of a higher education. Youth also will decide to return to university if employment in the labour market is difficult and slow. Youth who follow this approach hope that through enhanced education they will improve their knowledge and skills. Therefore, this puts schools in a very important position through their role in education of youth and in turn the future employment of young people. In fact, data in 2018 indicate that the labour market impacts on the link between education and social cohesion through the education–employment relationship. Table 4 provides 2011–2018 data of labor force participation and unemployed rates by educational attainment in Taiwan. The labor force participation rates of the vocational group and the junior college group are higher than the senior high school & below group, the college group and the graduate group. Conversely, the unemployed rates of the vocational group and the junior college group are lower than the senior high school & below group, the college group and the graduate group.

Table 4. Labor Force Participation and Unemployed Rates by Educational Attainment since 2011–Annual by Period, Gender, Indicators and Education in Taiwan, End of 2011–2018

year	Labor Force Participation Rates							
	Total	Primary School & Below	Junior High School	Senior High School	Vocational	Junior College	College	Graduate
2011	58.17	27.40	60.56	49.62	68.05	76.28	62.40	71.26
2012	58.35	27.36	60.51	49.62	68.04	75.51	62.65	71.24
2013	58.43	27.23	61.04	48.79	67.80	74.92	62.84	70.85
2014	58.54	25.79	60.64	49.16	67.68	74.52	63.32	72.35
2015	58.65	25.36	59.89	49.92	67.69	74.02	63.26	72.47
2016	58.75	25.31	60.00	50.41	67.48	74.04	62.83	71.14
2017	58.83	25.07	60.48	50.59	67.66	74.11	62.11	70.08
2018	58.99	24.88	61.37	50.94	67.97	74.32	61.42	68.97
year	Unemployed Rates							
	Total	Primary School &Below	Junior High School	Senior High School	Vocational	Junior College	College	Graduate
2011	4.39	2.52	4.44	4.75	4.63	3.40	5.79	2.97
2012	4.24	2.32	4.27	4.45	4.15	3.18	5.90	3.49
2013	4.18	2.29	4.29	4.25	4.06	3.11	5.81	3.29
2014	3.96	2.04	3.87	3.79	3.85	3.09	5.58	2.97
2015	3.78	1.84	3.29	3.80	3.84	2.75	5.34	2.94
2016	3.92	2.31	3.52	3.99	3.87	2.91	5.38	3.00
2017	3.76	2.20	3.27	3.86	3.69	2.77	5.19	2.82
2018	3.71	2.39	3.25	3.80	3.53	2.70	5.12	2.91

Source: Directorate General of Budget, Accounting and Statistics (DGBAS) of Executive Yuan, R.O.C. (Taiwan)

Unit:%

Taiwan is pushed to take vigorous action against the risk that poor transitions from school to work create in generating social and economic marginality. The crisis has shown how the problems in the youth labour market are structurally linked to education and training. There is agreement on the importance of education and training in the downturn, and this is driven by considerations the need to keep young people engaged. An analysis of contemporary educational reform reveals a concern with transforming Taiwan society and economy in the face of global economic change. In the face of the recession, the current education system is not equipped to mitigate dislocation in the labor market. Even as millions of jobs have been generated since the 2008 crisis, the majority of these jobs have been very low wage. Young people have to compete with a growing number of well-educated new graduates. Policy mixes are needed to reform educational systems and provide the necessary flexibility of training pathways. Taiwan focuses on the need to improve employability (in particular of young people) and on the development of skills relevant for the labour market. Confronting economic stagnation, government has begun constructing industrial policies built on top of theories of entrepreneurial innovation. The sense of entrepreneurship becomes an explicit goal of the vocational curriculum. It is important that vocational education is attractive for the students. The opportunities for schools to set up partnerships with local industry should be strengthened. Skills training policies need to be augmented with labor market and social protection policies to redress the obstacles to workforce participation, increase employment, and reduce vulnerability of employment.

### 3.4 Employment and GDP

Employment and productivity patterns reveal important mismatches in Taiwan. 59.38 percent of the employment (workforce) is in the services-producing industries that contributes to 1.58 percent of GDP; 35.71 percent of the employment is in the goods-producing industries that contributes to 1.64 percent of GDP; 4.91 percent of the employment is in the agriculture, forestry, fishing and animal husbandry that contributes to only 0.15 percent of GDP, which is shown in Table 5. Especially, 26.80 percent of the workforce is in the manufacturing employment. Those employed in services-producing industries have the low payment. More than half of Taiwan's labour force is paid-employees, own-account workers or employers, which fortunately signal entrepreneurial energy.

Table 5. Employment by Industry and Contributions to percent change in real gross domestic product in Taiwan, End of 1993—2018

	2018 Employment by Industry (1000 Persons)	2018 Average Monthly Earnings		% of GDP			
		Value (1 N.T.\$)	Increase or decrease from the previous period	1993	2009	2016	2017
A. Agriculture, Forestry, Fishing and Animal Husbandry	561	-	-	0.11	-0.04	-0.17	0.15
Goods-producing industries		-	-	-	-	-	-
Subtotal	4083	46,604	2,845	-	-	-	-
B. Mining and Quarrying	4	47,157	556	0.05	-0.02	-0.01	0.00
C. Manufacturing	3064	46,928	2,932	1.13	-0.69	0.92	1.64
D. Electricity and Gas Supply	30	99,697	28,013	0.22	0.09	0.10	-0.01
E. Water Supply and Remediation Services	81	37,552	-1,335	0.00	0.01	0.02	0.02
F. Construction	904	41,699	949	0.50	-0.28	-0.04	-0.01
Services-producing industries		-	-	-	-	-	-
Subtotal	6790	46,494	-277	-	-	-	-
G. Wholesale and Retail Trade	1901	44,184	-407	1.02	-0.33	0.16	0.61
H. Transportation and Storage	446	47,905	604	0.21	-0.15	0.09	0.17
I. Accommodation and Food Services	838	32,059	-169	0.13	-0.02	0.04	0.01
J. Information and Communication	258	60,006	147	0.30	0.09	0.11	0.10
K. Finance and Insurance	432	63,932	-1,267	0.77	-0.53	0.15	0.33
L. Real Estate and Ownership of Dwellings	106	44,366	-298	1.05	0.19	0.07	0.13
M. Professional, Scientific and Technical Services	374	54,354	-733	0.17	0.00	0.01	-0.02
N. Support Services	296	36,115	374	0.06	-0.05	0.05	0.05
O. Public Administration and Defence $\bar{F}$ Compulsory Social Security	367	-	-	0.43	0.06	0.00	0.06
<b>P. Education</b>	<b>653</b>	<b>25,195</b>	<b>-611</b>	<b>0.34</b>	<b>0.11</b>	<b>-0.04</b>	<b>-0.04</b>
Q. Human Health and Social Work Services	456	61,506	-12	0.14	0.12	0.08	0.04
R. Arts, Entertainment and Recreation	110	36,700	-269	0.07	0.02	0.01	0.02
S. Other Services	554	32,572	98	0.09	0.03	-0.01	0.03
Total	11434	46,542	1,076	-	-	-	-
By Major Activities : Agriculture	561 (4.91)	-	-	0.11	-0.04	-0.17	0.15
By Major Activities : Industry	4083(35.71)	-	-	1.90	-0.89	0.99	1.64
By Major Activities : Services	6790(59.38)	-	-	5.28	-0.69	0.84	1.58
Addendum : ICT Industry	-	-	-	0.66	0.38	0.81	1.12

Source: Directorate General of Budget, Accounting and Statistics (DGBAS) of Executive Yuan, R.O.C. (Taiwan)

Unit: Thousand Persons, 1 N.T.\$, Percentage Points

### 3.5 Wage and Education Level of Graduates

By further analysis in the item of average monthly earnings, those higher salary industries include “Electricity and Gas Supply”, “Information and Communication”, “Finance and Insurance”, “Professional, Scientific and Technical Services”, and “Human Health and Social Work Services”; however those lower salary industries include “Accommodation and Food Services”, “Support Services”, “Education”, “Arts, Entertainment and Recreation”, “Other Services”, and “Water Supply and Remediation Services”. Table 6 presents data on relationships between full-time salary and education level of graduates. The percentage of full-time salary under 35,000(N.T.\$.) for those with a bachelor's degree and those with an associate B.A. degree is 66.70% and 64.14% respectively. Those who graduate face a potential human capital mismatch within the labour market, with their academic capital deemed useless in the current economic climate or not recognised as valuable in their respective occupational field, particularly if they have studied in the arts, humanities or social sciences. This means that many leave university and are forced to take jobs designed for people with a low skill level or no qualifications, and their hard-won academic capital gets wasted.

Table 6. Full-time salary and education level of graduates from Taiwan in 2017

discipline	under 20,000 (N.T.\$.)		20,000~ under 25,000		25,000~ under 30,000		30,000~ under 35,000		35,000~ under 40,000	
	Number	%	Number	%	Number	%	Number	%	Number	%
Total	2,124	.0024	194,558	.2224	140,652	.1608	164,336	.1879	83,586	.0956
Doctor	7	.0008	245	.0286	68	.0079	123	.0144	127	.0148
Master	177	.0011	8,874	.0566	6,001	.0383	14,435	.0921	16,486	.1051
Bachelor	1,782	.0027	168,535	.2588	124,584	.1913	139,491	.2142	61,877	.0950
Associate B.A.	158	.0027	16,904	.2903	9,999	.1717	10,287	.1767	5,096	.0875

discipline	40,000~ under 45,000		45,000~ under 50,000		50,000~ under 55,000		55,000~ under 60,000		60,000~ under 70,000	
	Number	%	Number	%	Number	%	Number	%	Number	%
Total	88,706	.1014	58,630	.0670	44,992	.0514	28,615	.0327	36,855	.0421
Doctor	197	.0230	237	.0277	256	.0299	914	.1066	2,768	.3229
Master	23,112	.1474	19,841	.1265	18,392	.1173	11,935	.0761	18,037	.1150
Bachelor	59,794	.0918	34,905	.0536	23,320	.0358	13,760	.0211	14,872	.0228
Associate B.A.	5,603	.0962	3,647	.0626	3,024	.0519	2,006	.0345	1,178	.0202

discipline	70,000~ under 80,000		80,000~ under 90,000		90,000~ under 100,000		100,000 and above (N.T.\$.)	
	Number	%	Number	%	Number	%	Number	%
Total	10,367	.0119	9,092	.0104	3,613	.0041	8,644	.0099
Doctor	1,374	.1603	864	.1008	335	.0391	1,056	.1232
Master	5,654	.0361	5,649	.0360	2,357	.0150	5,846	.0373
Bachelor	3,231	.0050	2,488	.0038	885	.0014	1,650	.0025
Associate B.A.	108	.0019	91	.0016	36	.0006	92	.0016

Source: Ministry of Labor of Executive Yuan, R.O.C. (Taiwan)

Unit: 1 person, %

### 3.6 Number of Graduates at Senior Secondary School, Associate B.A. and Bachelor Degree

Taiwan's secondary technological and vocational education is the senior secondary and junior high technological and vocational education, and includes technological education of junior high schools, skill-based senior secondary schools, vocational education departments affiliated to general senior secondary schools, and comprehensive senior secondary schools. Higher technological and vocational education in Taiwan is divided into junior colleges (2-year and 5-year), technical colleges and universities of science and technology. (Minister of Education Republic of China, 2018) In 1991, the % of GDP by education and the economic growth rate are 0.47 and 8.36 respectively that the enrolment percents of TVET and general education of senior secondary school are .7449 and .2551 respectively, and that the enrolment percents of Associate B.A. and Bachelor Degree of higher education are .6004 and .3996 respectively, which is shown in Table 7. In 2016, the % of GDP by education and the economic growth rate are -0.04 and 1.51 respectively that the enrolment percents of TVET and general education of senior secondary school are .5227 and .4773 respectively, and that the enrolment percents of Associate B.A. and Bachelor Degree of higher education are .0707 and .9293 respectively. There is a clear shifting pattern of participation as students and their parents prefer general education in senior secondary education as a strategic decision to secure a pathway to higher educational levels. The enrolment in vocational programmes is outnumbered by far enrolment in (pre-) academic education. TVET is known as the second chance of education for children. It is meant to integrate young people into the labour market and to offer educational



opportunities for those who could not benefit from higher education. TVET development at the level of secondary education can bring a positive effect in increasing the employability of graduates. TVET, relevant to labour market needs, becomes increasingly more important than educational achievements. The educational reforms in secondary schools should place the spotlight on TVET, with the aim of delivering effective training to meet the skills need-ed by industry.

Table 7. Number of Graduates at Senior Secondary School, Associate B.A. and Bachelor Degree, and Economic Growth Rate in Taiwan, End of 1968—2017

year	Senior Secondary School				Higher Education				% of GDP by education	Economic Growth Rate, GDP Growth Rate (%)
	(1)General Education + (2)Comprehensive High Schoo + (3)General Education in Continuing Education		(1)Vocational Education + (2) Practical Technical Program + (3)Vocational Education in Continuing Education		Associate B.A.		Bachelor Degree			
	Number	%	Number	%	Number	%	Number	%		
1968	43215	.5666	33061	.4334	9,035	.3844	14,472	.6156	9.71	
1969	46162	.5259	41608	.4741	15,437	.4765	16,959	.5235	9.59	
1970	50269	.4836	53676	.5164	19,114	.5267	17,173	.4733	11.51	
1971	51975	.4414	65784	.5586	21,203	.5316	18,683	.4684	13.43	
1972	62218	.4381	79806	.5619	26,040	.5666	19,922	.4334	13.87	
1973	60665	.4283	80991	.5717	31,441	.5841	22,388	.4159	12.83	
1974	59872	.4027	88820	.5973	34,784	.5861	24,564	.4139	2.67	
1975	56373	.3521	103721	.6479	32,637	.5519	26,498	.4481	6.19	
1976	55943	.3299	113634	.6701	33,495	.5356	29,043	.4644	14.28	
1977	59935	.3230	125595	.6770	34,320	.5363	29,675	.4637	11.41	
1978	55168	.3128	121222	.6872	34,732	.5324	30,508	.4676	13.56	
1979	55319	.3011	128389	.6989	37,739	.5384	32,360	.4616	8.83	
1980	55964	.2869	139126	.7131	38,370	.5436	32,214	.4564	8.04	
1981	56488	.2830	143117	.7170	40,827	.5598	32,102	.4402	7.11	
1982	57467	.2707	154826	.7293	43,330	.5624	33,710	.4376	4.80	
1983	58213	.2575	167881	.7425	46,227	.5641	35,716	.4359	0.17	
<b>1984</b>	<b>60999</b>	<b>.2655</b>	<b>168731</b>	<b>.7345</b>	<b>47,877</b>	<b>.5641</b>	<b>36,998</b>	<b>.4359</b>	<b>0.23</b>	<b>10.05</b>
1985	61478	.2660	169663	.7340	54,703	.5861	38,625	.4139	0.16	4.81
1986	61825	.2587	177119	.7413	56,408	.5908	39,065	.4092	0.19	11.52
1987	63036	.2568	182439	.7432	57,082	.5857	40,380	.4143	0.26	12.70
1988	66573	.2520	197642	.7480	58,912	.5873	41,406	.4127	0.21	8.02
1989	65616	.2660	181019	.7340	65,177	.6028	42,952	.3972	0.21	8.75
1990	66279	.2696	179568	.7304	72,867	.5960	49,399	.4040	0.26	5.65
<b>1991</b>	<b>64305</b>	<b>.2551</b>	<b>187787</b>	<b>.7449</b>	<b>81,683</b>	<b>.6004</b>	<b>54,375</b>	<b>.3996</b>	<b>0.47</b>	<b>8.36</b>
1992	70496	.2622	198399	.7378	87,427	.5951	59,478	.4049	0.26	8.29
1993	76401	.2652	211734	.7348	98,433	.6091	63,160	.3909	0.34	6.80
1994	77121	.2618	217427	.7382	100,793	.5978	67,823	.4022	0.27	7.49
1995	79310	.2695	214960	.7305	105,113	.5977	70,748	.4023	0.32	6.50
1996	81319	.2706	219173	.7294	107,626	.5917	74,255	.4083	0.35	6.18
1997	85743	.2868	213180	.7132	114,182	.5710	85,802	.4290	0.28	6.11
1998	91333	.3010	212124	.6990	120,886	.5803	87,421	.4197	0.19	4.21
1999	103391	.3369	203494	.6631	129,507	.5639	100,171	.4361	0.22	6.72
2000	107116	.3589	191377	.6411	126,916	.5194	117,430	.4806	0.16	6.42
2001	114278	.3899	178809	.6101	123,317	.4576	146,166	.5424	0.22	-1.26
2002	126482	.4500	154583	.5500	110,208	.3850	176,044	.6150	0.32	5.57
2003	120988	.4760	133204	.5240	91,009	.3206	192,854	.6794	0.23	4.12
2004	126298	.4940	129346	.5060	81,603	.2791	210,763	.7209	0.17	6.51
2005	134124	.5012	133496	.4988	56,837	.2054	219,919	.7946	0.09	5.42
2006	136062	.4983	136997	.5017	43,803	.1608	228,645	.8392	0.20	5.62
2007	137358	.4918	141962	.5082	35,815	.1346	230,198	.8654	0.12	6.52
2008	132930	.4796	144220	.5204	28,014	.1095	227,885	.8905	0.10	0.70
2009	132550	.4756	146167	.5244	24,668	.0980	227,174	.9020	0.11	-1.57
<b>2010</b>	<b>130416</b>	<b>.4615</b>	<b>152189</b>	<b>.5385</b>	<b>20,463</b>	<b>.0821</b>	<b>228,878</b>	<b>.9179</b>	<b>0.11</b>	<b>10.63</b>
2011	129795	.4646	149586	.5354	19,205	.0763	232,448	.9237	0.12	3.80
2012	129959	.4676	147951	.5324	18,075	.0738	226,799	.9262	0.05	2.06
2013	129996	.4692	147051	.5308	18,240	.0738	228,762	.9262	0.03	2.20
2014	129638	.4755	143000	.5245	18,842	.0759	229,546	.9241	0.05	4.02
2015	119956	.4795	130216	.5205	17,485	.0700	232,417	.9300	0.01	0.81
<b>2016</b>	<b>111521</b>	<b>.4773</b>	<b>122121</b>	<b>.5227</b>	<b>17,403</b>	<b>.0707</b>	<b>228,793</b>	<b>.9293</b>	<b>-0.04</b>	<b>1.51</b>
<b>2017</b>	<b>117242</b>	<b>.4858</b>	<b>124115</b>	<b>.5142</b>	<b>16,147</b>	<b>.0653</b>	<b>231,003</b>	<b>.9347</b>	<b>-0.04</b>	<b>3.08</b>

Source: Ministry of Education of Executive Yuan, R.O.C. (Taiwan)

Unit: 1 person, %

### 3.7 Educational Expenditure and Tertiary Education

As individuals fail to develop educationally enhanced careers, societies lose out on the possibility of raising their levels of human capital. The path to Taiwan competitiveness is paved with university degrees, explaining why Taiwan institutions aim to have 82 per cent of young people completing tertiary education by 2005, which is shown in Table 8. The tertiary education gross enrollment ratios (%) develops from 47.0 in 1998 to 83.7 in 2014 in Taiwan. The rhetoric of Taiwan inclusivity policy indicates a commitment towards ensuring that the young people have relatively equal access to higher education so that they can all compete in the labour market, having sufficiently qualified themselves to do so. However, the more likely outcome is the creation of an enlarged pool of young people competing with each other for a shrunken range of opportunities. Taiwan has generally given greater priority to educational spending since 2000, but the public spending on education as a proportion of Gross national income (GNI,%) has decreased. Table 8 shows the declines in expenditure on education in Taiwan in the late 2000s in relation to its GNI. For instance, the rate of educational expenditure / Gross national income (GNI,%) declines from 6.18 in 1998 to 5.04 in 2014; the number of the educational expenditure develops from 5671.5(100Million N.T.\$) in 1998 to 8382.6 in 2014. Such expenditures are vital for poverty reduction and for enhancing the capabilities of people to benefit from globalization. Education is a key element in a global economy where education, skills and knowledge are increasingly important for economic survival. But Table 7 demonstrates that % of GDP by education is -0.04 in both 2016 and 2017, the level of investment in education still is insufficient.

Table 8. The educational expenditure and Tertiary education gross enrollment ratios in Taiwan, End of 1998—2014

year	educational expenditure (100Million N.T.\$)	educational expenditure / Gross national income (GNI,%)	tertiary education gross enrollment ratios (%)
1998	5671.5	6.18	47.0
1999	6006.0	6.19	50.5
2000	5487.6	5.23	56.1
2001	5904.4	5.70	63.0
2002	6148.0	5.63	67.6
2003	6326.9	5.60	72.4
2004	6580.2	5.47	78.1
2005	6838.6	5.52	82.0
2006	7021.8	5.42	83.6
2007	7107.8	5.17	85.3
2008	7307.6	5.43	83.2
2009	7782.6	5.82	82.2
2010	7652.8	5.26	83.8
2011	7845.2	5.34	83.4
2012	8178.6	5.40	84.4
2013	8326.3	5.32	83.9
2014	8382.6	5.04	83.7

Source: Directorate General of Budget, Accounting and Statistics (DGBAS), and Ministry of Education of Executive Yuan, R.O.C. (Taiwan)

Unit: 100Million N.T.\$, %, %

Taiwan has taken steps to improve the articulation of secondary vocational education with higher education in order to open more options for students and to meet the increasing demand for skills and qualifications. The junior colleges were established in 1970s due to rapid industrialisation and an increasing demand for middle-level technicians with both a theoretical understanding and practical skills. Due to an articulated curriculum, school-industry cooperation, including internships, industry-based training, joint college/industry research programmes, active work of industry/college cooperation committees and curriculum development at the industries' request, college graduates are highly valued in Taiwan. As demand for tertiary education has increased, those vocational programmes have been developed in polytechnic-type tertiary vocational institutions. Taiwan is opening up new pathways for TVET students onto higher education as well as responding to the industry needs. Technical colleges have developed post-diploma programmes to deliver such newer skills to both degree and non-degree graduates, as well as for those wishing to upgrade their skills. In Taiwan, TVET programs have been a part of the educational landscape for almost a 50 years, which is shown in Table 7.

Currently there are multiple missions for TVET, including a focus on entry-level job preparation, adult retraining programs, college/university preparatory coursework, postsecondary options and second-chance opportunities. This has resulted in some innovative educational approaches. For example, some high school TVET programs offer both high school and college/university credits in a dual-credit arrangement. Many high school TVET courses and programs are articulated to TVET programs of study at 2-year community and technical colleges. These agreements between

educational institutions are designed to encourage TVET students to continue their education past high school and earn an industry credential, an associate B.A. Degree, or both. With the integration of vocational training into the education system, vocational qualifications become equivalent to the other academic qualifications awarded. Taiwan has been through a dual process, gradually incorporating vocational training into the education system while at the same time developing the vocational pathway.

#### 4. Discussion

Due to skill-biased technological change, labour demand will increase relative to supply for more highly educated people. A well-educated and skilled population is seen as a core competitive advantage in an increasing globalised world economy. Thus, investments in human capital that enhance the development of knowledge, skills and the quality of the labour force, might be perceived as investments in an area with high social and economic returns. Encouraging employer demand for skills and an emphasis on achieving better utilisation of skills in the workplace are now priorities for “Skills Taiwan”. Young people are confronted with an increasing fragmentation and flexibility and will have to cope with permanent changing working conditions, rotation between diverse work fields and temporary flexible employment. This will require that the education system and vocational training system are capable of equipping future workers and businesses need to take full advantage of the new technologies. Since Taiwan needs to compete in terms of the quality of goods and services, this requires a highly skilled labour force. Human capital is Taiwan’s important asset; therefore, the quality of education and educational systems in Taiwan must be improved. This applies to the employment, education and social inclusion policies.

Increasing the store of human capital will tackle unemployment and low-wage, and help prepare the local for economic recovery and restore its ability to compete economically with its global counterparts. Enterprises need innovation to thrive in the market, and this can come from entrepreneurs but also from the employees that are TVET graduates. Vocational education is located in a prominent position to support innovation in enterprises. Vocationalisation has been viewed as an instrument in increasing economic competitiveness through improving productivity and employability. There is a positive correlation between national growth and investments in education, but only if the produced qualifications can be absorbed by the labour market. Even for those who work in the informal sector, education is helpful in order to have access to better jobs and higher income rates. This correlation between the GDP and TVET encourages governments to consider the process of vocationalisation seriously. Human capital arises from three sources: education, training and, perhaps most important for entrepreneurship. It should note how vocational education has a crucial position in providing opportunities for promising educational careers and prospective labour market positions.

A significant part of the economic growth results from the knowledge and skills of the workforce, and TVET system with its production of skills meets the increasing demands of the national economy. There is a demand for double qualifications which have both a vocational and an academic component. There is an academic shift in vocational education and training, in the sense of initial vocational training leading into successive university-level study. Taiwan is like some advanced countries deeply struggling with challenges relating to reducing government deficits, and company restructuring after the financial and economic uncertainties. TVET development at the level of secondary education can bring a positive effect in increasing the employability of graduates. TVET, relevant to labour market needs, becomes increasingly more important than educational achievements. Trainees in the dual vocational training system should be subject to compulsory schooling until they complete TVET even if they are older than 18. In this dual system programme, instruction takes place in part-time vocational schools catering to apprentices who receive both theoretical instruction and some general education. Adolescents who leave a general education school after the secondary grades should be obliged to attend some programme leading to an officially recognised vocational education until the age of 18. TVET-education fulfils a key function both socially and economically.

Trends of the vocationalisation of higher education represent the ways education is adjusting to changes in the socio-economic environment. Different ways of implementing vocationalisation include incorporation of more vocationally oriented content and the provision of work-based learning/work experience, and collaborative arrangements between universities and colleges. Pathways from TVET to bachelor’s and master’s degrees are crucial so that students have options for moving from one stream to the other. A more integrated secondary, post-secondary, TVET, and higher education system enables acquisition of qualifications and certification in a flexible learning pathway. A policy framework that blends skills training with higher education opportunities could help enhance the prestige of TVET. Taiwan hopes to fill the gap between school and work, thus giving more job opportunities to young people, and the highly skilled technicians industry badly needs, and so to recover from economic crisis. Student by the age of 18 should gain a TVET certificate. Besides giving young people the opportunity to enrol in tertiary studies, the TVET system should aim to provide them with smooth transitions into industry. Taiwan should have a flexible education system that offers individuals multiple opportunities to gain qualifications.

Under the pressure of youth unemployment and low-wage, Taiwan educational policy should develop vocational certifications integrated into the hierarchy of general education levels while promoting alternating training in the form of apprenticeships or school-based programmes. The interaction involving university-industry-government is fundamental in leveraging innovation in a knowledge-based society. Taiwan should introduce an increasing range of policies encouraging the involvement of universities in technology transfer. Again, Taiwan has a unique set of arrangements at upper secondary level because much of the vocational training is designed as career exploration rather than preparation for a specific job. Despite vocational education becoming more popular, the quality of education is considered poor and is characterized by a high presence of low SES (socio-economic status) students. The educational reforms in secondary schools should place the spotlight on TVET, with the aim of raising retention to achieve year 12 qualifications, as well as delivering effective training to meet the skills needed by industry. However, the main users of TVET continue to be low achievers and socioeconomically disadvantaged students, and the pathways to post-school education and training or employment are still poor. As a consequence, vocational education in school often fails to provide for smooth transitions into the work market and full-time employment, with the students ending up in casual and low-skilled occupations. This is one of the important appeals of the educational reform.

## 5. Conclusions

### 5.1 Challenges and Issues

Human capital is the key driver of economic development. Continued investments in human resources development should be present for the economic development of the local communities. There is a need to support governments in skills development planning aligned with socioeconomic development. Due to the progressive ageing of the society and the decrease in economically active population, Taiwan shall focus on the improvement of the quality of its education and vocational training system. The importance of investing in TVET to promote social and economic development has been acknowledged. It is important to take actions for facilitating the re-integration into education and giving a positive employment perspective to those youth that have low education and qualifications. Taiwan should make substantial progress in linking the TVET much better to other parts of the education system, and open access to university studies to vocationally qualified. Because the share of TVET students at the upper secondary and tertiary levels over the past decades has changed (decrease), Taiwan will need to continue to expand vocational education provision in the secondary schools, as part of a mixed-mode curriculum for all pupils. Apart from reconstructing secondary education, more open-ended school-industry relations are possible when companies are willing to make new machinery and equipment accessible to work-based learning.

Creating a dynamic partnership between TVET and society has become one of the missions for Taiwan. For improvement of the reputation of TVET, the following trends can be seen as important: Firstly, vocational qualifications should provide access to university education; Secondly, development of a common qualification framework for vocational and higher education; Thirdly, development of interdisciplinary links across traditional academic disciplines; Fourthly, development of employability skills can be seen as a priority for both vocational and higher education. (Margarita Pavlova and Rupert Maclean, 2013; Felix Rauner, 2012) Especially, the “National Vocational Education Qualification Framework” needs to consider community colleges and associate degrees. Nowadays only 7% of college enrolment in Taiwan is in community colleges and associate degrees offering 2-year associate degree programmes. These programmes act as a mezzanine layer that bridges the worlds of vocational training and higher education. The government should recognize the need to create comprehensive skills development and training policies to meet the needs of the labour market and to enhance economic growth. Taiwan needs to create a regulatory framework for these new types of qualifications to flourish. It also needs to increase the flexibility of institutions to address issues of employability, and this includes recognition of prior learning, credit for apprenticeships and a pathway for the upgrading of skills.

### 5.2 Limitations and Implications

Matching skills and knowledge to the needs of employment is challenging in the context of rapid technological change, resulting in a reconfiguration of occupations. It is the role of education to provide young people with the competencies needed in society. Two forms of education have been identified to tackle youth unemployment: entrepreneurship education and vocational education. Vocational education should prepare students for their working life; however, entrepreneurship education can improve the attractiveness of vocational education. (Daniele Morselli, 2015). Support to education is a key priority in enabling the local communities to become knowledge-based economies. In response to SBTC, Taiwan should consider policy options to strengthen the human resource base required to serve the growth sectors of the economy and to increase employment, and make significant effort to redesign education policy in line with a national innovation framework. Taiwan should recognize that vocational education and training, but also secondary and higher vocational education give a major contribution to economic competitiveness. This study also aims

to contribute to understandings of how social origin permeates the structures and experience of TVET. We focus on how social origin plays out in the lives of students and the ways in which social origin shapes their preparation for transition to future lives and employment. TVET is often understood as saving the working-class subject and this is achieved by transforming them into more middle-class through the provision of forms of capital. We are interested in how and whether TVET constitutes part of a process of social inclusion and mobility. Moreover, in the 2010s, austerity measures, involving extensive cuts to public services as well as wider job insecurities, have affected the middle-classes as well as the working-classes, whose concerns about exclusion and downward mobility may result in opportunity hoarding.

Secondary and higher technological and vocational education in Taiwan should emphasize studying with practical action as its main element, offering the abilities necessary for work in the job market and linking up with the local industries. In addition, the education must take root downward, implement the professional knowledge and curiosity of elementary and junior high schools to raise the attractiveness of the technological and vocational sector. Secondary schools are more accountable for developing the economic and labour force needs of society through placing a greater emphasis on skills development for employability. The demand to enhance productivity and employability brings this vocational element at the secondary school level, together with general and prevocational options. TVET development at the level of secondary education can bring a positive effect in increasing the employability of graduates. But there is a clear shifting pattern of participation as students and their parents prefer general education in senior secondary education as a strategic decision to secure a pathway to higher educational levels. The enrolment in vocational programmes is outnumbered by far enrolment in (pre-) academic education in Taiwan. A widely debated about the local communities and their development in a changing world where labor participation and social inclusion of young people have been challenged. The paper shows that the emphasis on labor market flexibility has much weakened in the direction: there has been a shift from labor market flexibility to the flexibility of educational systems. There is increasing consensus toward the idea that the fight against youth unemployment and low-wage should start at school, not after school. This is one of the important appeals of the educational reform.

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