

**THE DEVELOPMENT OF A NEW MALAYSIAN SKILLS QUALIFICATION
FRAMEWORK (MSQF) IN THE CONTEXT OF NATIONAL DUAL
TRAINING SYSTEM (NDTS)**

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ABSTRACT

The Malaysian Skills Qualification Framework (MSQF) was formulated to classify skilled qualification that indicates the level of capabilities on competency descriptors. MSQF currently enforces competence-based training approach in skills training which is in line with National Occupational Skills Standard (NOSS). With the advent of National Dual Training System (NDTS), the existing MSQF may need to be revamped due to new requirements resulting from new orientation toward work process. Thus, the purpose of the study was to analyze the effectiveness of the existing MSQF for MSC shop-floor automotive technicians at level 3 to qualify as knowledge workers (K-workers). The study adopted the interpretive qualitative research design which was premised on the phenomenological method by using interview and observation. For purpose of data collection, participants selected for this study were those who have more than five years of experience in automotive industry and understand NOSS-based training and NDTS. The data analysis forms the themes and the categories that are useful to develop a new framework to show the relationships that exist among the categories under study. This study found that NOSS standards qualify students with specialized skills which restricts them in carrying out other duties and to understand the whole work process were facing challenges especially in fulfilling the industry needs due to technological and work organization changes. Secondly, NDTS based on the work process concept builds upon the business process orientation of new industry and supported by the whole work processes rather than specific or functional units only. Thirdly, based on the research data the new MSQF for MSC shop-floor automotive technicians at level 3 needs to be characterized in line with the two descriptors that are professional competence (knowledge and skills) and personal competence (social skills and autonomy). It is recommended that the new MSQF must be put in place in order to qualify appropriate K-workers for the automotive industry in Malaysia.



ABSTRAK

Kerangka Kelayakan Kemahiran Malaysia (KKKM) digubal untuk mengklasifikasikan kelayakan kemahiran yang menunjukkan tahap kompetensi yang dicapai. KKKM kini adalah pendekatan latihan kemahiran berasaskan kecekapan berdasarkan kepada Standard Kemahiran Pekerjaan Kebangsaan (SKPK). Dengan memperkenalkan Sistem Latihan Dual Nasional (SLDN), KKKM sedia ada perlu dirombak kerana keupayaan untuk memeluk keperluan baru akibat daripada orientasi baru ke arah proses kerja. Kajian ini dianalisis keberkesanan KKKM yang sedia ada bagi Sijil Kemahiran Malaysia (SKM) bagi juruteknik automotif pada tahap 3 untuk layak sebagai pekerja berpengetahuan (K-pekerja). Kajian menggunakan rekabentuk penyelidikan kualitatif tafsiran yang berlandaskan pendekatan fenomenologi dengan menggunakan kaedah temubual dan pemerhatian. Bagi tujuan pengumpulan data, peserta yang dipilih adalah mempunyai lebih daripada lima tahun pengalaman dalam industri automotif serta memahami latihan berasaskan SKPK dan SLDN. Data analisis digabungkan membentuk kategori dan tema digunakan membangunkan satu kerangka kelayakan baru untuk menunjukkan hubungan yang wujud antara kategori di dalam kajian. Kajian ini mendapati bahawa SKPK melahirkan pelajar dengan kemahiran yang khusus serta menghadkan mereka dalam melaksanakan tugas-tugas lain dalam memahami proses kerja keseluruhan menyebabkan menghadapi cabaran terutama bagi memenuhi keperluan industri kerana perubahan teknologi dan kerja dalam organisasi. Kedua, SLDN berdasarkan konsep proses kerja membentuk kepada proses orientasi perniagaan dengan memenuhi keperluan industri baru serta disokong dengan proses kerja keseluruhan dan bukan unit atau fungsi tertentu sahaja. Ketiga, berdasarkan data penyelidikan dimana KKKM baru untuk SKM juruteknik automotif tahap 3 perlu mempunyai ciri-ciri sejajar dengan dua taksiran iaitu kecekapan profesional (pengetahuan dan kemahiran); dan kecekapan peribadi (kemahiran sosial dan autonomi). Disyorkan KKKM baru ini menggantikan tempat yang sedia ada bagi melahirkan K-pekerja yang bersesuaian dalam industri automotif di Malaysia.



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LIST OF SYMBOLS AND ABBREVIATIONS

CBT	-	Competency-based Training
CEDEFOP	-	European Centre for the Development of Vocational Training
DACUM	-	Developing a Curriculum
DSD	-	Department of Skills Development
DSP	-	Dual System Project
DQF	-	German Qualification Framework
ECVET	-	European Credit System for Vocational and Training
EPU	-	Economic Planning Unit, Prime Minister's Department
EQF	-	European Qualification Framework
HRD	-	Human Resource Development
HRDC	-	Human Resource Development Council
ILO	-	International Labor Organisation
IMP	-	Industrial Malaysia Plan
LAN	-	Lembaga Akreditasi Negara (National Accreditation Board)
LWA	-	Learn and Work Assignments
MITI	-	Malaysia of International Trade and Industry
MLVK	-	<i>Majlis Latihan Vokasional Kebangsaan</i> (National Industrial Training and Trade Certification Board)
MoHE	-	Ministry of Higher Education
MoHR	-	Ministry of Human Resources
MSC	-	Malaysian Skill Certificate
MSAD	-	Malaysian Skills Advanced Diploma
MSD	-	Malaysian Skill Diploma
MSQF	-	Malaysian Skill Qualification Framework
MQA	-	Malaysian Qualification Agency
MQF	-	Malaysian Qualification Framework
NAB	-	National Accreditation Board
NDTS	-	National Dual Training System
NITTCB	-	National Industrial Training and Trade Certification Board
NOCC	-	National Occupational Core Curriculum
NOSS	-	National Occupational Skills Standards
NQF	-	National Qualification Framework



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NTS	-	National Trade Standards
NVQ	-	National Vocational Qualification
NVTC	-	National Vocational Training Council
RPL	-	Recognition prior training
QAD	-	Quality Assurance Division
VET	-	Vocational Education Technical



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CHAPTER 1

VOCATIONAL EDUCATION AND SKILLS TRAINING IN MALAYSIA

1.1 Introduction

This chapter aims to cast a general understanding about Malaysian vocational education and skills training are history, distinct features, current situation and challenges surrounding it. It will also lead to the problem statement of this study. Shedding some understanding about the situation in Malaysia, it would be appropriate also to examine about the Malaysian economy and its relation to human capital demand. The chapter was written and organized in five main parts: (1) the development of Malaysia's human capital and knowledge workers (K-workers); (2) the overview of vocational education and training (VET) in Malaysia; (3) the overview of skills training in Malaysia which supply skilled workers; (i) brief history of National Skills Qualification and Malaysian Qualification Framework in Malaysia (ii) roles of Department of Skill Development (DSD) in coordinating training and developing standards for certification of Malaysian Skill Certification (MSC) or *Persijilan Kemahiran Malaysia (SKM)* with various training approaches; (iii) the National Dual Training System (NDTS) as a new model to skills training; and (iv) the current of national standards used for skills training; (4) the compatibility of occupational standards the adaptation of technological and work organization changes; and (5) the problem statement to supply of K-workers to meet the need of the industries.



1.2 The human resources scenario in Malaysia

The main focus of Malaysian development plan is to upgrade the quality of its human resources in order to boost economic growth (M. Aslam *et al.*, 2003, p 2). The human resource development program has made a positive impact on Malaysian economy (Malaysia, 2006b, p 210). Malaysia's economic policies have always strongly emphasized human resources development. The structure of employments by major occupational categories reflected the increased demand for high skilled human resources as shown in Table 1.1. Demand for workers in the 'Technicians and Associates Professional' are expected to increase by 2.0 percent annually (*ibid*). In addition, substantial funds are provided to develop critical skill areas such as advanced manufacturing technology (robotics, intelligent software, smart sensors, high-tech packaging, automation and nano-processing) and advanced materials such as in petrochemical, automotive, biotechnology, electrical/electronic, and agricultural industries (Malaysia, 2006b, p 238).

Table 1.1: Employment by major occupational groups, 2000-2010
(Source: Malaysia, 2006b, p 253)

	'000 person			% of Total			Average Annual Growth Rate (%)	
	2000	2005	2010	2000	2005	2010	8MP	9MP
Senior Official & Managers	639.9	871.6	1,018.00	6.9	8	8.5	6.4	3.2
Professionals	537.9	680.9	778.4	5.8	6.2	6.5	4.8	2.7
Technicians & Associates Professional	1,122.70	1,430.50	1,580.80	12	13.1	13.2	5.1	2
Clerical Workers	890.4	991.4	1,018.00	9.6	9.1	8.5	2.2	0.5
Services Workers & Shop & Market sales Workers	1,205.60	1,558.00	1,892.20	13	14.3	15.8	5.3	4
Skilled Agricultural & Fishery Workers	1,391.20	1,376.00	1,344.90	15	12.6	11.2	-0.2	-0.5
Craft & Related Trade Workers	844	1,263.80	1,604.80	9.1	11.6	13.4	8.4	4.9
Plants & Machine Operator & Assemblers	1,493.20	1,568.90	1,628.70	16.1	14.5	13.6	1	0.8

The demand for skilled labor has increased significantly as a result of globalization and changes in organization (ILO, 1998, p 11-12). The speed of technological change needs workers who are able to learn and adapt quickly, continuously and competently to new technology. The new scenario of employment focused on increased productivity that is significantly dependent on the quality of employees and training rendered for the workforce. According to the Economic Planning Unit (EPU), the Ninth Malaysia Plan (2006-2010) has allocated approximately RM 812 million (USD 257 billion) in development expenditure to the public technical and vocational schools (Jailani *et al.*, 2006, p 4). The move is hoped to ensure that technical and vocational students are equipped and enhanced with required knowledge and skills so that they could be competitive and in turn succeeded in the knowledge-based economy (K-economy) (MoHR, 2008b, p 2). Through the Tenth Malaysia Plan (2011-2015) the government allocates RM 1 billion (USD 0.32 billion) for skills training development (Malaysia, 2010, p 223).

The dynamic of global labor market has provided opportunities for investment in education and skills sectors. In 2007, the National Master Plan for Education (2007-2020) and the National Master Plan for Higher Education (2007-2020) were launched. These master plans have become the roadmap for education in the country. For the skills training sector, the Master Plan for Occupational Skills Development (2008-2020) was established in (what year) to meet the requirements for skilled workers for 22 industrial sectors (MoHR, 2008b). This Master Plan requires that each sector to devise a structured plan to meet the requirements of a knowledge based-economy. Malaysia also faces problem of economic competition from low wage labor of neighbouring countries such as Indonesia, Bangladesh, Burma and Vietnam. Relatively higher wages in Malaysia has caused foreign investment to shift to these low wages countries. The problem was compounded when the Malaysian authorities allowed the importation of mass low-skilled foreign labor from those countries to satisfy the local commercial needs. The issue of low-skilled workforce is still rampant in Malaysia as compared to other emerging industrial countries such as Singapore, Taiwan and South Korea. Even though foreign investors are offered various types of incentives and opportunities to invest in Malaysia, they tend to employ low-skilled cheap labor, including hiring low skilled foreign immigrants. This has caused minimal technology transfer and low productivity (Jajri, 2007, 41-78).



Human capital is the most critical element to be developed in order to achieve sustainable economic development. A series of Malaysia's 5-year plans has emphasized human capital as their prime goal. But still, the achievement of the goal is far from satisfactory. Thus, Malaysia needs to address the following issues: (1) the low number of highly technical skilled workforce; (2) the shortage of K-workers in the industry; (3) the occurrence of mismatch in the supply and demand of skilled workers (4) the suitable provision of training to meet industry needs; (5) the capacity of qualified human resources for conducting R&D; and (6) the creation of innovative workforce that can compete in global environment (MoHR, 2007b, p 9-10). In 2010, Malaysia outlines the Roadmap of Economic Transformation Program (ETP) as a comprehensive framework to transform Malaysia into a high-income nation by 2020 (Department of Prime Minister (DPM), 2010, p 5-7). This roadmap is also designed to transforming education as an engine of growth (*ibid*, p 475):

“We aspire to produce... more engineers and professionals, more specialist and skills technical talent who succeed in an increasingly competitive global market”. (DPM, 2010, p 475)

ETP is projected to create an incremental 3.3 million jobs with a shift toward higher paid job. Thus, there are new opportunities for Malaysians to strengthen their knowledge and skills to be employed (*ibid*, p 21). Skilled workers of high income nation possess qualifications to enhance knowledge generation and innovation, thus generating higher level of productivity (*ibid*, p 192). Figure 1.1 shows the percentage of skilled workers in Malaysia as compared to other countries high-income economies. Malaysia is still at the lower echelon when compared to the average percentage of skilled workers in OECD countries. Therefore, Malaysia should concentrate effort to catch up with first-world skilled and talent base by 2020.



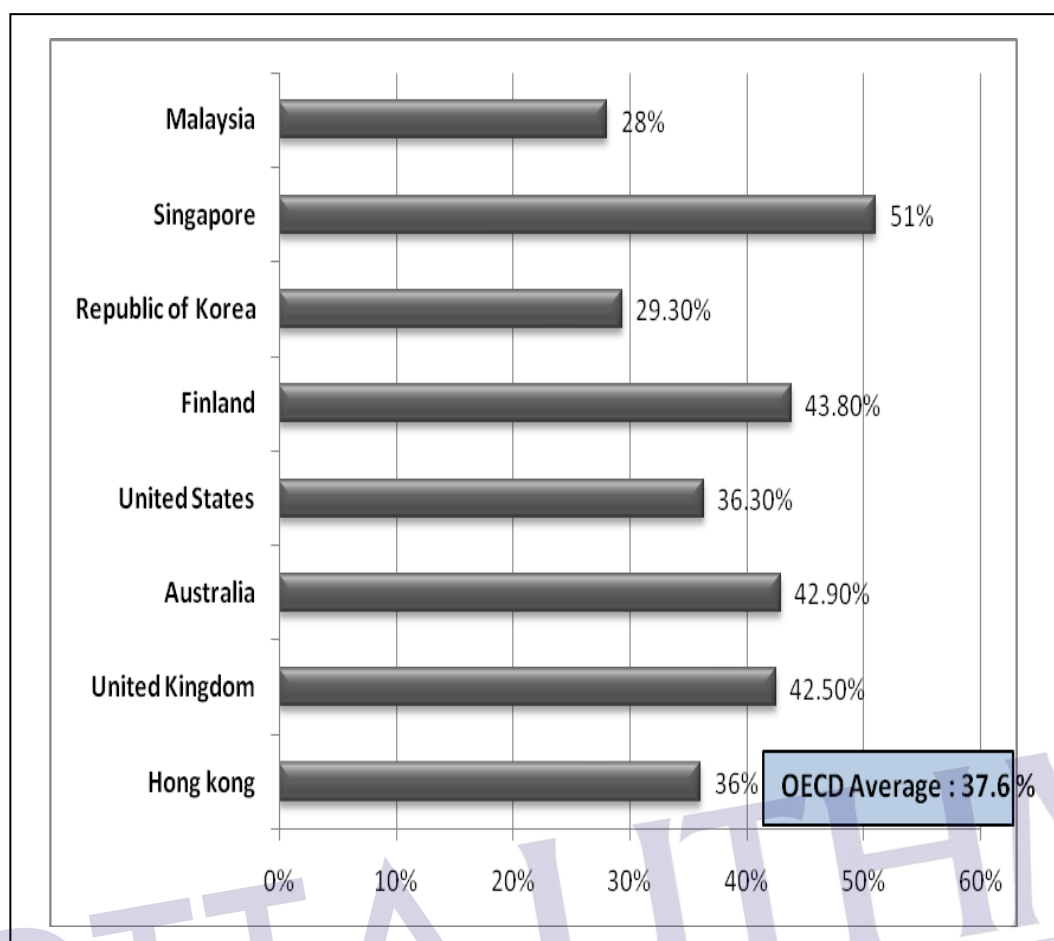


Figure 1.1: Skilled labor force of selected countries in 2008
(Source: DPM, 2010, p 192)

There are approximately 8.4 million existing unskilled and semi-skilled workers in Malaysia (*ibid*, p 192). This is a relatively significant number of unskilled and semi-skilled workers that need to be trained or retrained in order to become K-workers. Thus, to be competitive at regional and global level, Malaysia should consider the following strategies: (1) review the education and training system with a shift toward developing “creative and critical thinking”; (2) increase emphasis on reintroducing technical and vocational training; (3) identify and nurture talent through a demand-driven process; and (4) improve autonomy and accountability of educational system; (5) enhance English language proficiency; and (6) deliver high quality education and training (*ibid*). New Economic Model (NEM) for Malaysia noted that globalization has created a competition for talent, forcing companies and governments to recognize that human resources are the valuable asset (NEAC, 2010, p 8).

The Malaysian government has allocated a total of RM 35.94 billion (USD11.4 billion) in 9MP to implement the various education and training programs (MoHR, 2007b, p 9-10). According to Malaysian Education Development policy (2001-2010), higher education is considered a major contributor to the development of human resources to meet the needs of labor market. For Malaysia to achieve its vision of becoming an industrialized nation by 2020, the policy has also emphasized the development of high-tech skills (MoE, 2006, p 132). In fulfilling this vision, the government has supported the development of infrastructure in the country. High-tech industries are playing and continue to assume a key role in the development of K-economy in this country. The number of Malaysian labor force has increased from 10.24 million in 2003 to 10.89 million in 2007 (DoS, 2008). The number of employed person increases by 6.8 percent in 2007 to 10.54 million as compared to 9.87 million in 2003. Over the same period, the unemployment rate is decreased from 3.6 percent in 2003 to 3.2 percent in 2007 as a shown in Table 1.2 (*ibid*). Inactive unemployment is categorized as (1) individuals who are available for work but did not look for work because either they believe no suitable work is available or they are not qualified to apply; (2) persons who are working part-time because of business conditions or because they could not find full-time work; and (3) persons who are available for work but are either on temporary layoff, or has a job waiting to start (BCStats, 2010, p 1). In 2009, the unemployment rate has increased to 3.9% (MPC, 2009, p 37).

Table 1.2: Labor force, employed and youth unemployment rate (2003-2007)
(Source: DoS, 2008)

	2003	2004	2005	2006	2007
Labor Force	10,240	10,346	10,413	10,629	10,890
Employed	9,870	9,980	10,045	10,275	10,538
Unemployment rate	3.6	3.5	3.5	3.2	3.2

In the Tenth Malaysia Plan (2011-2015), the government has targeted employment to reach 13.2 million jobs and to reduce unemployment rate to 3.1% by 2015 (Malaysia, 2010). The government efforts include looking into the workforce's lack of competencies; lack of employability skills; and lack of relevant skills needed by employers. Manufacturing sector is projected to create 3.6 million jobs as shown in **APPENDIX A** (Malaysia, 2010, p 378). In 2007, 80 percent of Malaysia's

workforce possessed highest academic qualification of only Malaysian Education Certification or Sijil Pelajaran Malaysia (SPM) (NEAC, 2010, p 6). Therefore, the human capital situation in Malaysia is at a critical stage. Low skilled jobs equal low wages, skilled jobs are most often with higher wages (*ibid*, p 5). In Malaysia, the focus is clearly on higher education and professional training, despite the fact that 80 percent of the workforce is low skilled (Allais, 2010, p 100).

Industrial Malaysia Plan (IMP) 3 (2006-2020) noted a greater development effort within the manufacturing sector to: (1) continue to shift toward more capital intensive, higher value-added, higher technology and knowledge intensive activities; (2) strive within industries to produce more advanced products and provide better quality service, making knowledge to become a more important determining factor to remain competitive; (3) incorporate more knowledge-based activities and processes in industrial operation; (4) enhancing the application of technology to improve and develop new products and processes; and (5) equipping the workforce with the necessary skills in the technical professional field to facilitate the transition toward higher value-added activities (MITI, 2006, p 137 - 235). "Malaysia needs to increase the skills of its top category workers by 60% from the current level before 2020" (Wan Seman, 2005). Thus, Technical Education and Vocational Training (VET) need to be geared toward creating K-workers for the country to be competitive for the global market (Malaysia, 2006b, p 265-271).

The government has decided to implement National Dual Training System (NDTS) on 19th May, 2004 as a new approach to produce the K-workers. It plans to create 31,500 K-workers by the year 2010 (EPU, 2004). To encourage the industry develop relevant training for their employees, the Malaysian government introduced the Human Resources Development Fund (HRDF). A preliminary assessment conducted by the World Bank concluded that the Human Resources Development Fund (HRDF) has played a significant role in promoting more training for the private sector, especially among the small and medium scale companies (Tan, 2002). The training and retraining for work can help to alleviate skills and knowledge mismatch of the large segment of the labor force following the major economy restructuring (ILO, 2000). The development of the nation's human capital is one of the main agenda to be implemented, especially given the significant emphasis to increase knowledge and innovative capacity of its workers and to cultivate their first-class



mentality (MoHR, 2008a, p 3). In the Prime Minister of Malaysia speech it is stated that:

“The second thrust of the National Mission is to raise the country’s capacity for knowledge, creativity and innovation and nurture ‘first class mentality’. Malaysia’s future success depends on the quality of its human capital, not only in terms of intellect but also character. Therefore, in line with this thrust, the government aims to undertake comprehensive improvement of the country’s education system, from pre-school to tertiary and vocational institutions”. (A. Badawi, 2006)

According to Spottl (2000, p 97), there is a high demand of K-workers between the years 2000 and 2010. To achieve the government's intention of transforming the country to a knowledge-based economy, sufficient fund and effort must be generated to increase the number of K-workers. The government has formulated a variety of related policies to achieving this goal.

1.2.1 The development of K-workers

Malaysia still grapples with the task of building its economy to achieve a sustainable development to improve the quality of life of its people (Ramlee *et al.*, 2008, p 3). Vision 2020 for Malaysia clearly states that education and training are to be geared toward creating human resources and K-workers for industries that can compete in global market (Malaysia, 2006b, p 255). The government policies to develop K-workers such as: (1) the Ninth Malaysia Plan (2006-2010) was launched to intensify the development of K-workers who are competitive, flexible, dynamic and performance-oriented (Malaysia, 2006b, p 250-258); and (2) Third Outline Perspective Plan (OPP3: 2001-2010) was created to develop a dynamic labor force that is capable of meeting the challenges of a knowledge economy in order to enhance the productivity and competitiveness (Malaysia, 2001b, p 122). Malaysia aspires to become an industrialized and knowledge-based economy where most basic jobs of semi-skilled workers are to be replaced by automation. Thus, it requires a high number of K-workers to manage the advance work processes (Zanifa, 2007). The knowledge-based economy is considered as a major strategic move to increase the value-added of the economic sectors and to increase the strength of labor force

that can think and find solutions in the workplace (*ibid*). “Increasing the breadth of training opportunities are other ways in which companies (global) are creating more knowledgeable workers” (Blanchard & Thacker, 2007, p 12). Thus, an extensive review on the effect of globalization, societal change, and new technologies on the workplace should be conducted. According to Drucker (1999, p.157), a knowledge economy requires people with marketable workplace talent.

“Knowledge workers productivity is the biggest 21st century management challenge. In developed countries, it is their first survival requirement. In no other way can the developed countries hope to maintain themselves, let alone to maintain their leadership and their standards of living”.

K-workers feature are: (1) an ability to talk, read, write and using the information; (2) an ability to solve a problem and critical and creative thinking; (3) ability to cooperate and work as a group; (4) ability to work as professional with high integrity and responsible; and (5) social value that is referred to how they need to react, for example they must be honest, cooperate towards anything he want to achieve. (M. Sahandri & Saifuddin, 2009, p 685). K-workers feature are: (1) an ability to talk, read, write and using the information; (2) an ability to solve a problem and critical and creative thinking; (3) ability to cooperate and work as a group; (4) ability to work as professional with high integrity and responsible; and (5) social value that is referred to how they need to react, for example they must be honest, cooperate towards anything he want to achieve. (M. Sahandri & Saifuddin, 2009, p 685).

Harbison (1973) emphasized the importance of human capital development in which the workers’ knowledge and skills are applied to the production of goods and rendering of services. New kind of vocational programs are needed to prepare for highly skilled workers with flexibility, marketability and innovativeness. The economic challenge of the post-capitalist society will therefore be the productivity of new knowledge and the knowledge workers (Drucker, 1993, p 1). Hence, the K-workers can be described as individuals who are highly skilled, intelligent, motivated, innovative, and thinks like entrepreneurs. His/her knowledge and skills enabled him/her to direct his/her involvement in rapidly changing and increasingly complex work process that will deliver high quality work. In order to assist organizations improve their knowledge productivity, Drucker (1999, p 142) prescribes six major features: task, autonomy, continuing innovation, continuous

training, quality, and worker asset. Harrison and Kessels (2004, p 145) proposed that K-workers productivity relates to the way in which individuals, teams and units across an organization work together to generate knowledge-based improvements and innovations. Stam (2007, p 628-640) argued that “knowledge productivity refers to the process of transforming knowledge into value”. Thus, K-workers are those individuals who embrace life-long training, be able to work in a team and always anticipating the future needs of the workplace (Hoepfner & Koch, 2005, p 5). As Drucker (1959) describes K-workers as “those who works primarily with information or one who develops and uses knowledge in the workplace”.

Malaysia is currently lacking of the critical elements to support development of K-workers. The current workforce does not possess adequate knowledge and skills to qualify the K-worker status (Ramlee *et al.*, 2004, p 51-61). One can also argue that Malaysian primary and secondary education curricula do not sufficiently prepare average students to acquire the desired level of science, mathematical and social aptitudes that are fundamental for them to understand, appreciate, absorb and embrace the higher level thinking order as required for the development of K-workers. The problem is further compounded when the recruitment of candidates comprised largely of drop-out students since the more successful ones prefer to seek university studies or other professional study options. The scenario is entirely different in Germany, Japan, South Korea or Taiwan. Their youth have a positive mindset toward higher vocational training and are much better prepared in the sciences and mathematical disciplines to be more successful in their pursuit to be ‘K-workers’. In 2003, the report OECD Program for International Student Assessment (PISA) study an examination of the relative standing of countries in mathematics, science, reading, and problem solving, looking at a wider range of educational outcomes that includes students’ motivation to learn, their beliefs about themselves and their training strategies student performance in problem solving (OECD, 2003).

Thus, in Malaysia the pressure lies with the training systems to make good of those candidates, and the ultimate results were already there for all to see. The numbers were way short in both quantity and quality based on the target of 31,500 K-workers set in 2005 when NDTs was launched (NVTC, 2005). The importance of successful training system to continually develop the desired quality of K-workers has been emphasized by many. Drucker (2001) was also quoted as saying:



“This new knowledge economy will rely heavily on knowledge workers...the most striking growth will be in “knowledge technologists:” computer technicians, software designers, analysts in clinical labs, manufacturing technologists, paralegals”. (Drucker, 2001)

JICA did a study to assess basic knowledge among students in vocational schools in Malaysia (JICA, 2007, p 24; World Bank, 2009, p 85-86) that selected five local skills training institutes such as IKM Jasin, ADTEC Shah Alam, JMTI Penang, ITI Pemas and ITI Muar. The result of the study revealed that students were generally weak, and need to be placed in a special foundation course to enhance their basic skills before commencing their practical training. According to Allais (2010, p 57), in all countries in the study, to differing degrees, it was seen as a problem that technical vocational education and training (TVET), workplace-based or skills qualifications tend to have a lower status than school and university qualifications. According to Patton (2001a, p 15), the 21st century workers need to exhibit personal flexibility by characterizing the following attributes (1) ability to change with change; (2) ability to accept ambiguity and uncertainty; (3) ability to negotiate job or career changes; (4) ability to plan and act on shifting career opportunities; (5) ability to develop technical and social skills; and (6) ability to be resilient and persevere in the face of change. Vocational education is perceived as one of the crucial elements in enhancing economics productivity (Min, 1995, p 140-145; Ramlee *et al.*, 1999, p 1).

Technical Education and Vocational Training (TEVT) system has an important role in developing skilled workers as a K-workers to satisfy the needs of industry. On the other hand, the industry is less than satisfied with the quality of TVET students both in technical and personal attributes. Malaysia’s competitiveness depends on the quality of its workforce in the advent of K-economy and globalization. The study by Ramlee *et al.*, (2008, p 1-23), in his book titled *The K-Economy and Globalization - Are Our Students Ready?* Highlighted the specific skills, generic and transferable skills such as interpersonal, communication, thinking, problem-solving, and research skills should be incorporated in their education. According to Mohd Yusop *et al.* (2009, p 58-61), who studied the K-worker potentials among students in engineering education institutions in Malaysia, stated that cooperation is needed among skills training institutions and industry in an effort to set the scope of skills and knowledge for K-workers’ readiness in order to fulfill



industry needs. Wan Najib *et al.* (2007) wrote that the expectation and trust from investors are influenced by the capacity and capability of the country to produce K-workers that can satisfy industry needs.

The role of the Ministry of Human Resource is to draw up the policy, planning and coordinating all development and skills training programs. To make Vision 2020 a reality, the current system of development and skills training need to be re-evaluated and improved to ensure the supply of K-workers produced by all training agencies fulfil the needs of the industry (MoHR, 2008b, p 1). The Tenth Malaysia Plan (10MP: 2011-2015) emphasizes the need to move up the value chain for Malaysia to become a high-income economy (Malaysia, 2010). Vocational education and training represent the foundation for industrial and economic development (Seng, 2007, p 6-21). Investors and employers are constantly seeking skilled human capital to push their productivity and increase their return on investments (Blundell, R. *et al.*, 1999, p 9-10). Various studies were carried out about reliability and availability of human capital in productivity improvement. The result showed positive correlations between human capital and education and training achievement to maximize productivity (Zharir & Mansor, 2000, p 175).

Human resources policy must oversees the new standard for training to include technological knowledge and skills, innovativeness and the soft skills needed for the development of K-workers. It also includes the right standard needed to bridge the gap between training system for the workforce and the industrial requirements. Department of Skills Development (DSD) was given the responsibility to develop those training standards. In December 1992, DSD introduced the National Occupational Skills Standards or NOSS (NVTC, 2001). The industry also plays a crucial role to develop the skilled workforce to produce K-workers. Due to rapid changes in product, manufacturing process and markets dynamic in the K-based economy, the demand for continuous training and retraining of workers is continuous. Most Malaysian firm do not provide formal training for their workers (MoF, 2002, p 13), and training institutions are not equipped with the technology needed for the continuous training and retraining situations. A working formula is needed to address the issues involving both local training institutions and the industries concerned. Training for practical and theoretical knowledge should be integrated with the actual work environment. This would allow the workforces to solve real problem, and more importantly develop the critical thinking and problem



solving skills. Training at workplace will more likely develop more confidence and job satisfaction among workers. Closer coordination among various training institutions, industry players, and all stakeholders must be developed to address the continuous training issues.

1.3 Overview of Malaysian Vocational Education and Training (VET)

Education and training in Malaysia were influenced by four main factors: (1) the characteristics associated with country’s history as a British colony (2) The national and the country; (3) the formation of the constitution as a formal alliance, but with high centralism; and (4) the expansion drive since the 1980, including a commitment to develop the knowledge-based economy. The basic structural of the education and training system is shown in Figure 1.2 (Rashid & Nasir, 2003, p 7).

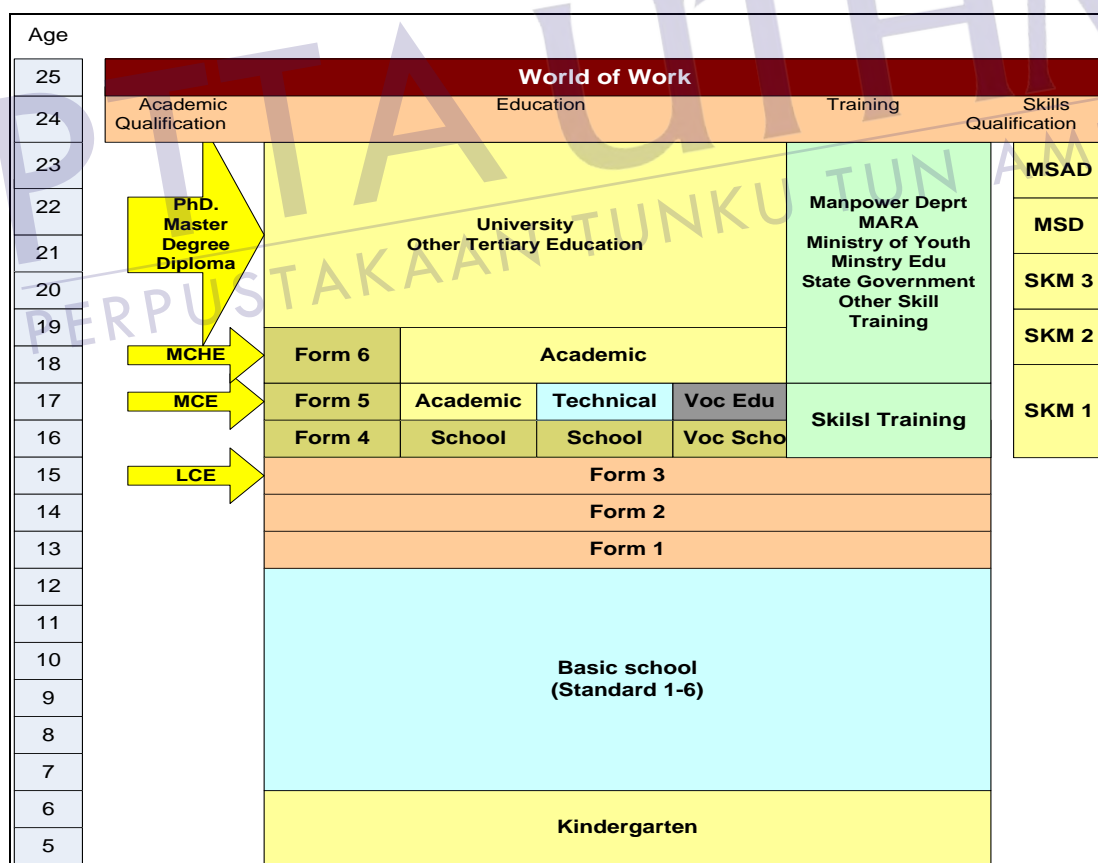


Figure 1.2: The structure of the education and training in Malaysia (Source: Rashid & Nasir, 2003)

In Malaysia, pre-school education is voluntary and most are fee-based. Basic schooling begins at the primary school with a period of six years (*ibid*). After primary schooling, students continue to attend secondary school for another five years (*ibid*). They will end up sitting for the Malaysian Education Certificate Examination at the end of the fifth year, and thereafter given the choice to go for higher education, namely pre-university, matriculation, polytechnics or community college (*ibid*). Table 1.3 shows the estimated number of enrolment and graduation under education, higher education and skills training in 2008 and 2009. There are small numbers of students joining the skills training as compared with higher education.

Table 1.3: Estimated statistic enrolment & graduation in 2008 and 2009
(Source: MoHR, 2010)

Sector	Enrolment (2008)	Graduation (2008)	Enrolment (2009)	Graduation (2009)
Education	5,200,000	-	5,400,000	-
High Education	950,000	221,000	1,051,000	251,000
Skills Training	170,000	97,000	121,000	86,000

There are five main pillars of Malaysian system of Education (World Bank, 1997, p 7-9) in Pang (2010, p 26). These categorized the Malaysian system into five main pillars such as:

- (i) 1st pillar: Public higher education system which catered to upper secondary school-leavers including polytechnics and community colleges under the Ministry of Higher Education, technical schools under the Ministry of Education, and training institutions under the Ministry of Human Resources, Ministry of Entrepreneur Development and Ministry of Youth & Sports;
- (ii) 2nd pillar: Malaysian Skills Qualifications Framework, a five-tiered skills certification system based on the NOSS, introduced by the NVTC in 1993;
- (iii) 3rd pillar: Company-based training, which comes under the HRD Fund established in 1993 to promote the training of employees;
- (iv) 4th pillar: Private higher education, largely under the purview of the Private Higher Education Institutions Act 1996, and accredited by the National Accreditation Board; and

- (v) 5th pillar: Continuing education and training which caters to the demands of employers, community or society at large for further education, skills upgrading, retraining, career advancement and enrichment.

According to Ahmad (2003, p 6), the PMR (Lower Secondary Examination) results can be an indicator of the achievement of primary education (see Table 1.4). After PMR, the students would continue with their upper secondary. At this stage, they would pursue their study either in ordinary school or vocational education and training (VET) as a shown **APPENDIX B** (Sarimah, 2005, p 372). The Malaysia VET system had a different streams or pathways, distinguishable in terms of producing the country's labor force, namely (1) higher education; (2) technical and vocational education; and (3) skills training (*ibid*). According to Caillods (1994, p 241), the vocational education and training are vital for developing labor mobility, adaptability and productivity. The results also contribute to enhancing competitiveness and redressing labor market imbalances.

Table 1.4: Main stream of the education and training system in Malaysia
(Source: Ahmad, 2003)

Stream or Pathway	Institution	Labor Force Preparation
Higher Education	Universities and other institutions of higher training, both public and private	Professional and managerial personnel such as engineers, architects, and surveyors
Technical and Vocational Education	Polytechnics, Technical Colleges and (more recently) community colleges	Supervisory personnel such as technical assistants and supervisors
Vocational Skills Training	Skills training institutions, public and private	Skilled and semi-skilled workers

Vocational educational in Malaysia was first introduced by the British in 1987 to train Malay youths as mechanics or fitters to manage the railway lines Federation of Malay (Zakaria, 1988; Ramlee *et al.*, 1999, p 2). In 1926, the first trade school was opened in Kuala Lumpur which marked the beginning of public vocational education in Malaysia (MoE, 1967). The trade school offered courses for fitters, electricians, carpenters, bricks layers, and tailors. In 1947, Junior Technical Trade Schools were established to provide a three-year course in machine shop practices, electrical installation, motor engineering, carpentry, bricklaying, and cabinet-making (*ibid*). The practice continued until those schools were eventually converted into a technical institute under the recommendation of the Razak Report

(MoE, 1965). The purpose was to provide semi-skilled and skilled workers for the expanding public and private sector businesses.

In 1967, a new vocational educational education system was introduced. Under this system vocational students had the choice either to enrol in a vocational or skills training program. The vocational education program required the students to take the Malaysian Certification of Vocational Education (MCVE) under Ministry of Education (MoE, 1967). Students who chose the skills training program must sit for the National Industrial Training and Trade Certification Board (NITTCB) examination under Ministry of Human Recourses (NITTCB, 1976). NITTCB was created by the National Advisory Council of Industrial Training to provide common trade standards and to improve the training institutions throughout the country (MoE, 1988; Ramlee *et al.*, 1999, p 3). Only 10 per cent of all upper secondary levels students chose to enrol in vocational training in 2006 (EPU, 2009b, p 26). In comparison to students in European countries such as the Netherlands, Germany and Austria, where majority of the students chose to enrol in vocational education.

Since 1980s Malaysia's economic development focused on human resource development through the implementation of public vocational and skills training institutions. The presence of private vocational and skills training institutions in Malaysia are quite limited. It is therefore apparent that vocational and skill training in Malaysia are mainly government driven. The government spending on education and training for the development of human capital is significantly associated with the economic planning and growth. The Federal government development expenditure for the Seventh Malaysia Plan (1996-2000) in the field of education and training was RM19.7 billion as compared to RM22.7 billion during the Eighth Malaysia Plan (2001-2005), (Malaysia, 2001a). For industrial training, provision of close to RM3.8 billion during the 8MP was about twice the allocation and expenditure of RM1.88 billion and RM1.83 billion, respectively in the 7MP (*ibid*, p 194-195). The 10MP (2011-2015), the government is funding about RM500 million to provide loans to workers; and school leavers for training and skills upgrading, RM150 million to train school dropouts; and 80 million to provide relief for workers retrenched without compensation (Malaysia, 2010, p 222).

According to Rashid and Nasir (2003, p 9), Malaysia's education and training system can be divided three main categories namely (1) tertiary or higher education at universities and institutes of higher education; (2) vocational and technical



education, especially in the formal school system under the Ministry of Education; and (3) post-secondary VET, including skills training of the secondary vocational school and mainly by public and private institutions of skills training. In terms of VET, there are different ministries which offer skills training such as:

- (1) Secondary Schools under the Ministry of Education – TVET is offered in secondary school namely technical or vocational schools;
- (2) Higher Education under the Ministry of Higher Education - TVET is offered in the polytechnics and Technical Universities.
- (3) Department of Skill Development under the Ministry of Human Resources - responsible for the coordination of public and private institution and certification of Skills Training in Malaysia;
- (4) Department of Manpower under the Ministry of Human Resources – Skills Training namely Industrial Training Institutes (ITI), Japan-Malaysia Technical Institute (JMTI) and Advanced Technology Training Centre (ADTEC);
- (5) Department of Youth and Sports, Ministry of Youth and Sports - National Youth Skills Institutes or *Institut Kemahiran Belia Negara* (IKBN);
- (6) State Government - Advanced Technical Institute (TATI). Selangor Skills Training Centre; Pahang Skills Development Centre (PSDC), Johor Skills Development Centre (PUSPATRI); Malacca Industrial Skills Development Centre (MISDC); and Kedah Industrial Skills and Management Development Centre (KISMEC); and Penang Skills Development Centre (PSDC);and
- (7) MARA under the Ministry of Ministry of Rural Development - MARA Skills Institute, University of Kuala Lumpur (UniKL), German-Malaysian Institute (GMi), UK-Malaysia Institute.

In Malaysia, the term “skills training” is often used interchangeably with “vocational training”. This is also often used in conjunction with the Technical and Vocational Education Training (TVET). The main federal legislation that determines the education system in Malaysia is the Education Act 1996 (Act 550) (Malaysia, 1996). This Act takes a very broad view of education that includes for all forms of education, including skills, specialized job-based and continuing training. The sub section 35(2) states that “technical education” covers the provision of (a) skills training; (b) talent training related to specific job; (c) training for the upgrading of existing skills; and (d) other technical or vocational training that are approved by the



Ministry of Education (Malaysia, 1996, p 26). In the 10 MP (2011-2015) and 2010 Budget Speech, the government reemphasized the importance of vocational and technical approach to skill training to produce skilled workforce with the purpose to satisfy industrial needs (JPA, 2010, p 1). Malaysia's education and training development effort comes from various ministries with their own training institutes. The same does not occur in other developed countries such as Germany, United Kingdom and others. Since many ministries are involved in skills training, coordination turns out to be most challenging (EPU, 2009b, p 5). Thus, it is difficult to harmonize and standardize the various qualifications from different Ministries for a single national skills training certification system.

Recently, skills training have been given legal standing in Malaysia through two national legislations. First, the Skills Development Fund Act 2004 (Act 640) was passed to create a special fund managed by the Skills Development Fund Corporation to provide to grant loans to trainees of approved skills training programs (Malaysia, 2004, p 14). Second, the National Skills Development Act 2006 (Act 652) becomes law effective 1st September 2006 (Malaysia, 2006a). This Act is significant because for the first time in this country, skills training has national recognition and given a legal status. This Act also aimed at enhancing skills development and upgrading of individual abilities needed for careers (MoHR, 2008b, p 5). The Act defines "skills training" as:

“...work based and industries oriented activities which aim to provide the knowledge, skills and understanding required for effective performance of a task or job, and includes refresher, further, updating and specialized job-related and training”.
(Malaysia, 2006a, p 8)

The Act is also considered the hallmark of the development of the country's skills training system because it contains provisions for the establishment, review, and use of NOSS which prior to 2006, has never been rooted in any national legislation.

1.4 Overview of skills training in Malaysia

In Malaysia the development of human resources is significantly driven by the government through public skills training institutes. A department or council should

be established to coordinate standards and quality assurance in order meets market demand (Pang, 2007, p 27-31). In 1987, the NITTCB and the Manpower Development Board (MDB) was changed to the National Vocational Training Council (NVTC) (MoLM, 1987). During the early 1990s, it became apparent that vocational training in Malaysia was no longer capable of meeting the skilled labor force needs of its fast paced industrialized economy (MoLM, 1990). In addition, the country's vocational training system was not flexible and responsive enough to meet the new challenges. New challenges pose significant transformation to improve their relevance, efficiency and effectiveness in responding to the challenges of increased competitiveness, economic restructuring, technological change and evolving social demands (Ducci, 1997, p 87). In order to produce as many skilled workers as possible, the Cabinet Committee on Training in 1991 called for the implementation of a more flexible training system, while taking into consideration the exploration of new technologies (MLVK, 1992). This includes the training of higher levels of skills; and the upgrading of skilled workers to technicians in certain complex jobs. NVTC was entrusted to identify the needs to overhaul the National Vocational Skills Certification System in December 1992 (*ibid*). The result gave way to the birth of the Malaysian Skills Qualification Framework (MSQF).

The adoption of the new five (5) level of Malaysian Skills Qualification Framework (MSQF) are Malaysian Skills Certificate (MSC) Level 1; Malaysian Skills Certificate (MSC) Level 2; Malaysian Skills Certificate (MSC) Level 3; Malaysian Skills Certificate (MSC) Level 4 or Malaysian Skills Diploma (MSD); and Malaysian Skills Certificate (MSC) Level 5 or Malaysian Skills Advanced Diploma (MSAD) was to replace the existing three tiered (Basic, Intermediate and Advanced) skill certification system (NVTC, 2001). The introduction of the accreditation system approach resulted in the Malaysian Skills Certification (MSC) or *Persijilan Kemahiran Malaysia (SKM)* which takes charge of the trade testing system (*ibid*). In Malaysia, the National Skills Qualification Framework (NSQF) was introduced in 1993. This was based on a five-level skills certificate framework, which was to merge into the National Occupational Skills Standards (NOSS) system for the skills sector. These qualifications are described as outcomes or competency-based.

Those attended skills training programs according to NOSS were awarded the Malaysian Skills Certificate (MSC). The public training institutions are operated by



various Federal ministries that include the Ministry of Human Resources; Ministry of Youth and Sports; Ministry of Entrepreneur and Cooperative Development; and the State Government. Skills training are concentrated in the lower levels as 90 percent of MSC certificates are handed out for level 1 and 2 graduates (EPU, 2009b, p 26). The scenario only reflected that low skills levels are more dominant across almost all industries. If Malaysia were to move up to a high income economy it will need to increase the enrolment of higher skills levels.

Malaysia skills training system had introduced a national blueprint called the Master Plan for Malaysia Occupational and Training for 2008 to 2020. This blueprint aims to develop knowledgeable and highly skilled workforce equipped with positive values and attitudes. There are (five) 5 main thrusts in the Master Plan, namely: (1) consolidating the national skills development and training system; (2) enhancing the quality of skills development and training; (3) improving accessibility and opportunity for individual; (4) meeting the skilled workforce needs of industry; and (5) enhancing the esteem and recognition of skilled-based qualifications and careers (MoHR, 2008b, p 10-11). The objective of the main trusts in the national blueprint is shown in Table 1.5 (DSD, 2008a, p 5):

Table 1.5: Main thrusts in master plan for Malaysia occupational and training (2008 to 2020) (Source: DSD, 2008a)

Thrust	Objective
<p>(1) Consolidating the national skills development and training system</p>	<p>The main goal is to develop a training system national skills development in which both public and private sectors can work together in an effective, efficient and together, to meet the needs of industry and individuals. The objectives identified are:</p> <ul style="list-style-type: none"> • to develop and manage the National Occupational Skill Standard (NOSS), which covers the needs of all sectors industrial and employment areas; • to develop and manage Malaysian Skills Qualifications Framework (MSQF) in the Qualifications Framework Malaysia (MQF), for the purpose of recognition of qualifications skills, accreditation, accumulation and credit transfer and articulation; • to develop a holistic competency model requires combining several different approaches to the analysis of job performance, meet skills workers competency requirements of the industry and individuals; and • to develop training programs more flexible in terms of duration and curriculum.

Table 1.5: (continued)

Thrust	Objective
(2) Enhancing the quality of skills development and training	<p>The main goal is to increase the quality of skills workers through skills training development to meet the needs of national industries and individuals. The objectives identified are:</p> <ul style="list-style-type: none"> • to ensure the provision of skills training to meet requirements, quality assurance regulations and procedures; • to develop competencies of skills training officers and instructors; • to develop, promote and provide access to use high-quality training materials; • to improve and measurement systems for quality of skill workers by institutions or training providers; • to develop and implement of delivery system in skills training to meet the needs of industry and individual competencies; and • to ensure that the graduates of skills training provider to achieve minima standard of requirement from industry and country.
(3) Improving accessibility and opportunity for individual	<p>The main goal is to expand and enhance access and opportunity for individuals to enter the training system and skills development national objectives. The objectives identified are:</p> <ul style="list-style-type: none"> • to enhance the system of skills training development through delivery approach including training in various institutions (institution-based) and training in the industry (industry-based); • to provide counselling services and enhance the development of careers of individuals involved in skills training ; • to expand its assistance and financial support for individuals which involved training and skills; • to provide and expand the flexibility and opportunities skills training and lifelong training to meet individuals requirements; • to expand training opportunities for broad-based and multi-skilling to enable individuals to obtain career path more flexible to fulfill needs of individual and labor market; and • to develop and manage the labor market information system for skills development training.
(4) Meeting the skilled labor force needs of industry	<p>The main goal is to enhance skills training development of capacity to meet industry needs today and the future. The objectives identified are:</p> <ul style="list-style-type: none"> • strengthening the role of industry in the skills training development and preparation; • improve the structure and mechanism negotiation, consultation and cooperation facilitate the involvement of the industry; • identifying and addressing areas that suffered a shortage of skill workers critical; • expanding use of training facilities and expertise of the industry; • expanding skills training is supported and funded by the industry; and • strengthening unit between training institutions (off-the- job) and practical training (on-the-job).
(5) Enhancing the esteem and recognition of skilled-based qualifications and careers	<p>The main goal is to enhance the acceptance and public recognition of the value of skills training a profitable investment for industry and individuals. The objectives identified are:</p> <ul style="list-style-type: none"> • minimize the negative perception and stigma society the training and skills-based career skills; • enhance community acceptance and recognition about the skills training development and promote skills-based career a job well based; and • developing market information profiles human resources competencies.

In order to enhance competitiveness and economic performance, labor productivity should be increased through improved training; better management;

increased R & D; enhanced innovation and increased use of technology and ICT in all sectors of the economy (Malaysia, 2006b, p 123). Nevertheless the public and private training institutions need to be proactive in meeting those improvements as industries seek to be more competitiveness in the global markets. More adaptable, trainable and multi-skilled workforce is highly sought for by industries. Access to advanced skills training should be more available in order to produce highly skills human resources, particularly at diploma and advanced diploma levels. Therefore, the capacity of advanced training programs should be expanded and continually redesigned to meet the demand for skilled workers (MoHR, 2007a, p 12). To realize the aspiration of the government in achieving the status of a developed nation by 2020, the development of skilled workforce requires special attention. Based on the National Mission that underlined the 10MP (2011-2015), the DSD is expected to play a key role in increasing the level of knowledge, technical skills and innovation of the Malaysian workforce (Malaysia, 2010, p 222). Thus, DSD needs to improve its action plans to fulfil the national agenda to drive the nation toward achieving high income economy.

1.4.1 Brief history of National Skills Qualification and Malaysian Qualification Framework in Malaysia

In Malaysia, the National Skills Qualification Framework (NSQF) was introduced in 1993. This was based on a five-level skills certificate framework, which was to merge into the National Occupational Skills Standards system for the skills sector (NVTC, 2001). These qualifications are described as outcomes or competency-based (*ibid*). Mainly low levels of qualifications are awarded, and there is limited opportunity to move up the education and training system with them. In 1996 a National Accreditation Board was established for higher education, with responsibility for regulating the standards of private higher education institutions (colleges and universities), which had increased in number following the liberalization of markets and increased public investment (Wikipaida, 2009; Direct Study Malaysia, 2009). School qualifications, which are excluded, have many variants, associated with different types of schools, quality, status, and which pathways they lead learners to, and are ostensibly at a higher level than some other



qualifications which are on the framework (*ibid*). The NSQF relates to four types of providers universities and colleges, polytechnics, community colleges, and skills centres (Wikepeida, 2009). Funding and administration for these providers has been through three systems those for universities and colleges, polytechnics and community colleges, and skills centres, respectively. Responsibility for the funding and administration of the skills centres is located in the Ministry of Human Resources and for universities and colleges, and polytechnics and community colleges across separate divisions of the Ministry for Higher Education (*ibid*).

The Malaysian Qualifications Framework or the MQF is a unified system of post-secondary qualifications offered on a national basis in Malaysia. It is administered by the Malaysian Qualifications Agency (MQA), a statutory body under the purview of the Ministry of Higher Education (MoHE) (*ibid*). With the rapid growth of the private education sector in Malaysia, the National Accreditation Board (Malay: *Lembaga Akreditasi Negara*) or LAN was established in 1996 to oversee the certification of standards and accreditation of academic programs provided by private colleges and universities in Malaysia. In April 2002, a Quality Assurance Division (QAD) was established by the Ministry of Education (MoE) to manage and coordinate the quality assurance system in public universities (*ibid*). Prior to the establishment of these bodies, no specific accreditation system existed and institutions of higher education had only to be duly established or registered under the relevant governing legislations Public Institutions of Higher Learning; Universities and University Colleges Act 1971; Private Institutions of Higher Learning; essential (Higher Educational Institutions) Regulations 1969 (repealed in 1996); Education Act 1996 and Private Higher Educational Institutions Act 1996 (*ibid*). In June 2003, a national consultation seminar was held to establish a national qualifications framework that would integrate, rationalize, justify and bring together all qualifications offered on a national basis into a single interconnected system (*ibid*). The MQF was finally adopted in 2007 and both the QAD and LAN were dissolved and their functions taken over by the MQA which was established on November 1, 2007 by the Malaysian Qualifications Agency Act 2007 (*ibid*).



1.4.2 The Department of Skills Development (DSD)

The Ministry of Human Resource (MoHR) is responsible for drawing up human resources policy, planning and coordinating all development of skills in this country. In order to achieve the nation's Vision 2020, the existing system of development and skills training programs need to be re-evaluated and improved to ensure the supply of skilled workers produced by all training agencies are relevant to the industry's needs (MoHR, 2008b, p 1). Department of Skill Development (DSD), previously known as the National Vocational Training Council (NVTC) was established under The Ministry of Human Resources on May 2, 1989 as a national body entrusted with the key role in developing, promoting and coordinating industrial and vocational training strategy and programs (NVTC, 2001). The main objectives of DSD are: (1) to coordinate training for public and private agencies; (2) to identify the needs of skilled workers from industrial sector; and (3) to develop the training standard namely National Occupational Skills Standard (NOSS). DSD was established under the National Skills Development Act (Act 652); for the purpose of coordinating and increasing the quality of skills training, and providing MSC certification (Malaysia, 2006a). This is to ensure that the institutions of skills training are meeting the national standard on NOSS (DSD, 2006a). In 2007, Malaysia has 373 training institutions for skill courses under various ministries such as the Ministry of Human Resource; the Ministry of Entrepreneur and Cooperative Development; and the Ministry of Youth and Sport. The number of private training institutions is 1,186 (*ibid*). They are accredited to offer 6,575 training programs based on NOSS as shown in Table 1.6 (MoHR, 2008b, p 25).

Table 1.6: Accredited centres for the year 2007 (Source: MoHR, 2008b)

Skills Training Providers	Accredited Centre	Accredited Programs
Private	813	3,929
Government	373	2,753
Total	1,186	6,683

Accredited Centre (AC) is the provider of skills training approved by the DSD-based accreditation system. There are 5 categories for accredited centres that are: (1) Public Accredited Centre; (2) Private Accredited Centre; (3) Industrial Accredited Centre; (4) Associated Accredited Centre; and (5) Non-Destructive Test

REFERENCES

- A. Badawi (2006). *Speech by the Prime Minister: The Tabling of the Motion on the Ninth Malaysia Plan (2006-2010)*. Dewan Rakyat, 31 March 2006.
- A. Hafidz. H.O. (2000). *The Influence of Culture on Muslim Athletes. A Case Study of 1998 Malaysian Commonwealth Games Athletes*. Doctor of Philosophy, Queensland University of Technology (Unpublished).
- ABD (2004). *Improving Technical Education and Vocational Training: Strategies for Asia*. Asian Development Bank (ADB). ISBN 971-561-565-1.
- Ahmad, O. (1993). *Development of National Occupational Skills Standards*. In MAHIR No. 20 June 1993; No. 21 June 1993. MLVK. Kuala Lumpur.
- Ahmad, O. (2003). *The Role of the National Vocational Training Council in the Management of Vocational Training in Malaysia: A Critical Evaluation*. Batu Pahat: KUiTTHO.
- Ahmed, M.F. (2010). *Technical and Vocational Education and Training—Curricula Reform Demand in Bangladesh. Qualification Requirements, Qualification Deficits and Reform Perspectives*. Doktors der Philosophie (Dr. phil.) genehmigte Abhandlung Vorgelegt von Institut für Erziehungswissenschaft und Psychologie.
- Alder, R. P. (1998). *Jobs, Technology, and Employability: Redefining the Social Contract*. A Report of the Aspen Institute Forum on Communications and Society. The Aspen Institute. Washington, USA.
- Allais, S (2009). *Qualification Frameworks: Implementation a Impact, Research Project on International Labor Office (ILO)*. Skills and Employability Department.
- Allais, S (2010). *The Implementation and Impact of National Qualification Framework*. ILO. Geneva.
- Anakwe, U., Hall, J.C. & Schor, S.M. (2000). *Knowledge-related Skills and Effective Career Management*. International Journal of Manpower.



PITAJUTAHM
PERPUSTAKAAN TUNKU TUN AMINAH

- Atkin, M.C. (Ed.) (1992). *Encyclopedia of Educational Research, Vol.4*. 6th Ed. New York: American Educational Research Association.
- Attwell, G (2007). *Pressures for change in the education of vocational education and training professionals*.
- Austraining Business Institute (2006). *Understanding competency based training*. Retrieved 14, June 2008, from <http://www.austrainingnsw.com.au/cbt.html>
- Bandura, A. (Ed.), (2000). *Self-Efficacy: The Exercise of Control*, W.H. Freeman and Company, New York, 5th edition.
- BCStats (2010). *Earnings & Employment Trends: July 2010*. British Columbia Statistics (BCStats). Retrieved 02 September, 2010 from <http://www.bcstats.gov.bc.ca/pubs/eet/eet1007.pdf>.
- Beienefled, S., Harris, N., Hellen, E., Hopbach, A. & Maguire, B. (2008). *Quality Assurance & Qualification Framework*. Focus Group. Helsinki, Finland.
- Bengsten, P.K (2009). *National Qualification Framework Essentials*. National Qualification Framework and Technical Vocational Education and Training in Pakistan. Report No.26 South Asia: Human Development Unit.
- BIBB (2005). *EQR Prüfbericht für den Hauptausschuss vom*. Federal Institute for Vocational Education and Training (BIBB).
- BiBB (2011). *VET in Europe – Country Report Germany 2011*. Federal Institute for Vocational Education and Training (BIBB).
- Bjornavold, J (2004). *Discussion note on New and Emerging Models in Vocational Education and Training and Higher*.
- Bjornavold, J and Coles, M (2007). *Governing Education and Training; the Case of Qualification Frameworks*. European Journal of Vocational Training.
- Bjornavold, J and Coles, M (2009). Draft: *The Added Value of National Qualification Frameworks in Implementing the EQF*. European Qualifications Framework: Explanatory note 2. CEDEFOP.
- Blanchard, P.N and Thacker, J.W (2007). *Effective Training: System, Strategies and Practices* ^{3rd}. Prentice Hall. New Jersey.
- Blumenstein, G., Borgel, H., Greinert, W., Grunwald, E., Jarck, K. & Kaloo, U. (1999). *Basic Study on the Design of a Dual Vocational Training Scheme in Malaysia. Final Report, May 1999*. Kuala Lumpur: GTZ.



- Blundell, R., Dearden, L., Meghir, C, and Sianesi, B. (1999). *Human Capital Investment: The Returns from Education and Training to the Individual, the Firm and the Economy. Fiscal Studies*. Vol 20, no.1.
- Blustein, D. L., Juntunen, C.L., & Worthington, R.L. (2000). *School-to-work Transition: Adjustment and Challenges of the Forgotten Half*. Lent and Brown (Eds.). *Handbook of Counseling Psychology*, 3rd Edition. John Wiley and Sons.
- Booth, A. L. and Dennis J. S. (1996). *Acquiring Skills: Market failures, their symptoms and policy responses*. Cambridge University Press.
- Boreham, N. (2002a). *Transforming vocational curricula with work process knowledge*. In Kamarainen, P., Attwell, G. & Brown, A. (Eds.). *Transformation of Training in Education and Training: Key Qualifications Revisited*. Luxembourg: Office for Official Publications of the European Communities.
- Boreham, N. (2002b). *Work process Knowledge, Curriculum of Control and the Work-based Route to Vocational Qualification*. Institute of Education, University of Stirling. *British Journal of Education Studies* ISSN0007-1005.
- Boreham, N. (2004a). *Orienting the work-based curriculum towards work process knowledge: a rationale and a German case study*. Routledge Taylors & Francis Group. Volume 26.
- Boreham, N (2004b). *Work Process Knowledge in European Vocational Education and Training Research*. Paper presented to the Symposium for European Conference on Educational Research, University of Crete, Greece
- Boreham, N. & Lamont, N. (2001). *Thematic Network on Work process Knowledge in Technological and Organizational Development*. Retrieved 02 September, 2010 from <http://www.manac.uk/education.euwhole/htm>.
- Boreham, N. and Morgan, C. (2002a). *Cases of organizational training in Company UK (United Kingdom)*. In Fischer, M. & Roben, P. (eds) *Cases of Organizational Training in European Chemical Companies: An Empirical Study* (Bremen, Universät Bremen Institut Technik und Bildung).
- Boreham, N., Samurcay, R and Fischer, M. (2002b). *Work process knowledge*. Routledge Studies in Human Resources Development. New York.
- Bremer, R (2001). *Entwicklung integrierter Berufsbildungspläne und Lernortkooperation*.



- Briscoe, G. & Wilson, R. (2003). *Modelling UK occupational employment*. International Journal of Manpower.
- Brockmann, M. Clarke, L. & Winch, C (2008). *Employment Sector: Employment Working Paper No. 44*. Geneva.
- Burges, R.G (1982). (Ed.) *Field Research: A Source Book and Field Manual*. London:Allen and Unwin.
- CAHPI (2001). *Occupational Standards Professional Building Official*. Human Resources Development Canada. Canadian Association of Home and Property Inspectors (CAHPI).
- Caillods, F. (1994). *Converging Trends Amidst Diversity in Vocational Training Systems*. International Labor Review 133 (2).
- CEDEFOP (2009). *The shift to training outcomes*. Policies and practices in Europe. Cedefop Reference series; 72. Office for Official Publications of the European Communities. Luxembourg.
- CEDEFOP (2010). *European Qualification Framework*. EQF Newsletter April 2010.
- CEDEFOP (2011). *Learning while Working Success Stories on Workplace Learning in Europe*. Luxembourg: Publications Office of the European Union. Retrieved 15 July, 2011 from: http://www.cedefop.europa.eu/EN/Files/3060_en.pdf
- Colardyn, D. & Bjornavold, J. (2005). *The Training Continuity: European inventory on validating non-formal and informal training*. Centre Européen pour le Développement de la Formation Professionnelle (CEDEFOP) Panorama Series.
- Coles, M. (2006). *Review of the development in the use of qualifications frameworks*. A Discussion Paper for the European Training Foundation. 3rd Draft.
- Collin, A. (1997). *Training and Development*. In I. Beardwell and L. Holden (Eds). *Human Resource Management: A Contemporary Perspective*, London: Pitman.
- COM (2006) 479 final version 2006/0163 (COD). *Vocational training. Development of vocational training policy*. EUROPEAN COMMISSION, Brussels.
- Creswell, W.J (1998). *Qualitative Inquiry and Research Design*. United states of America: SAGE Publication.
- Deissinger, T. (1997). *The German dual system – a model for Europe? Education + Training, 39(8)*.



- Denzin, N. K & Lincoln, Y.S. (1994). *Introduction: Entering the Field of Qualitative Research*. Thousand Oaks: Sage Publications
- Denzin, N. K & Lincoln Y.S (2000). *Handbook of Qualitative Research (2nd.Ed)*. Thousand Oaks, CA Sage.
- Dillon, B.D, Foster, D.G, Pollack, L.C & Whatford, J.C (2006). *Suggestions for Prefield and Postfield Research Supporting Archaeological Surveys of CDF Projects*.
- Direct Study Malaysia (2009) *National Accreditation Board (LAN) and National Qualifications Agency*. Retrieved 12 April, 2010, from http://www.directstudymalaysia.com/govern_bodies/nab.htm
- DoS (2008). *Social Statistics Bulletin, Malaysia*. Department of Statistics (DoS), Putrajaya.
- DPM (2010). *Economics Transformation Program (ETP): A Roadmap for Malaysia*. Department of Prime Minister (DPM). Putrajaya.
- DQR (2009). *Discussion Proposal for German Qualification Framework for Lifelong Training*. German Qualification Framework Working Group. *Deutscher Qualifikationsrahmen (DQR)*.
- DQR (2011). *German Qualification Framework for Lifelong Training*. German Qualification Framework Working Group. *Deutscher Qualifikationsrahmen (AK DQR)*.
- Drucker, P. F (1959). *Landmarks of Tomorrow: A Report on the New 'Post-Modern' World*.
- Drucker, P. F. (1993). *Postcapitalist Society*. New York: Harper Collins Publishers.
- Drucker, P. F. (1999). *Knowledge-worker productivity: the biggest challenge*. California Management Review, Vol. 41 No. 2.
- Drucker, P.F. (2001). *The next society*. *Economist.com*.
- DSD (2006a). *Laporan Kajian Lulusan Sijil Kemahiran Malaysia (SKM) di Industri*. Department of Skills Development (Unpublished).
- DSD (2006b). *Report of Statistic SKM 2006*. Putrajaya. Department of Skills Development. (Unpublished).
- DSD (2008a). *Action Plan Blue Print*. Putrajaya. Department of Skills Development.
- DSD (2008b). *National Skill Certification in Malaysia*. Department of Skills Development (DSD). Putrajaya.



- DSD (2009a). *Annual report 2009*. Putrajaya: Department of Skills Development (DSD).
- DSD (2009b). *National Skills Training System – the New Approach, Power Point Presentation*. Department of Skills Development (DSD). (Unpublished).
- DSD (2010a). *Annual Report*. Department of Skills Development (DSD). Putrajaya.
- DSD (2010b). *Enhancement of National Dual Training System (NDTS) in Malaysia: Expert*. Department of Skills Development (DSD). (Unpublished).
- DSP (2001). *Presenting the Components of the Dual System Project to the EPU*. Kuala Lumpur: DSP. (Unpublished).
- DSP (2002). *Suggested Terms of Reference for the Technical Committees for EPU's Dual System Project, Presented to the 2nd*. DSP Steering Committee on 7 October 2002. (Unpublished).
- DSP (2003). *The Dual System Project: Presentation to the Department of Higher Education Malaysia, 4 July*. Kuala Lumpur: DSP, Malaysia. (Unpublished).
- DSP (2004). *Curriculum Development for Highly Skilled Work: National Occupational Core Curricula (NOCCs), with Illustrations with the Motor Vehicle Field, Reference Copy*. Kuala Lumpur: DSP. (Unpublished).
- Ducci, M. (1997). *New Challenges to Vocational Training Authorities: Lessons from the Latin American Experience*. *International Journal of Manpower* – Vol. 18
- EPU (2003). *Determining the Final Shape of a National Dual Training Scheme and its Implementation – Edited Minutes of the Workshop*. *Workshop of the DSP Steering Committee, September, 2-3*. Kuala Lumpur: EPU. (Unpublished).
- EPU (2004). *Minit Mesyuarat Jawatankuasa Pemandu Bil. 1/2004 Projek 'Dual Training System in Malaysia'*, EPU, June 17. (Unpublished).
- EPU (2009b). *Report Human Capital for a High Income Economy*. Putrajaya Convention Centre (PICC), Putrajaya. (Unpublished).
- EPU (2010). *Introducing the Motion to Table The 10MP*. Speech by the Prime Minister Dato' Sri Mohd. Najib. Economy Planning Unit (EPU). Dewan Rakyat, Kuala Lumpur.
- European Communities (2005). *Toward a European Qualification Framework for Lifelong Training*. Commission Staff Working Document, Brussels.



- European Parliament (2008). *Recommendation of the European Parliament and of the Council on the establishment of the European qualifications framework for lifelong training*. Journal of the European Union. Luxembourg.
- Ezzy, D. (2002) *Qualitative Analysis: Practice and Innovation*. Crows Nest, NSW: Allen & Unwin.
- Fischer and Rauner (2005). *Work process Knowledge and Development of Vocational Competence*. Institute Technology and Education, University of Bremen, Germany.
- Fischer, M. (2002). *Work Experience as an Element of Work Process*. Work process Knowledge. Routledge. London.
- Fischer, M., & Boreham, N. (2004). *Work Process Knowledge: Origins of the Concept and Current Developments*. In Fischer, M., Boreham, N. & Nyhan, B. (Eds.), *European Perspectives on Training at Work: the Acquisition of Work Process Knowledge*. Thessaloniki: CEDEFOP.
- Flick, U. (2007). *Managing Quality in Qualitative Research*. London: SAGE.
- Fong, C. O. (2005), "Keynote and Opening Address". 11 January 2005.
- Fong, C. O. (2007). Speech : *Enhancing Organisational Effectiveness Through Superior Human Capital Management*. The National Human Resources Summit 2007. Crowne Plaza Mutiara Kuala Lumpur.
- Garavan, T.N. and McGuire, D. (2001). *Competencies and Workplace Training: some reflection on the rhetoric and the reality*. Journal of Workplace Training.
- Gasskov, V. (2000). *Managing Vocational Training Systems: A handbook for senior administrator*. International Labor Office (ILO). Geneva.
- Gerber, M. (2001). *Predictive Site Reconstruction based on Algorithmic Complexity: CR-Signatures of Partly Destroyed Mudbrick Buildings*. Technical Report, Institute of Ancient Near Eastern Archaeology and Languages, U B.
- Gerber, R. & Lankshear, C. (2000). *Smart Workforce*. Routledge. New York. USA.
- Gilgeous, V. & Parveen, K. (2001). Core Competency Requirement for Manufacturing Effectiveness. Journal of Integrated Manufacturing System. Vol 12.



- Greinert, W. (1992). *The Dual System of Vocational Training in the Federal Republic of Germany- Structure and Function*. Technical Cooperation - Federal Republic of Germany, p.2, Eschborn 1992.
- Groenewald, T. (2004). *International Journal of Qualitative Methods*, 3(1). Article 4. Retrieved September 1, 2007 in Pang, C. L. (2010). The Integration of the National Occupational Skills Standard (NOSS) and the National Dual Training System (NDTS) in Malaysia.
- Guba, E. G. & Lincoln, Y. S. (1981). *Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches*. San Francisco, CA: Jossey-Bass.
- Guinn, S.L. 2000. *Succession Planning Without Job Titles*. Section 2: Practitioner Papers. *Journal of Career Development International*. Vol 5. MCB UP Ltd.
- Hamilton, M.A. & Hamilton, S.F. (1997). *When is Work a Training Experience?* In *Phi Delta Kappan*. Vol.78.
- Hamilton, S. F. & Lempert, W. (1996). *The Impact of Apprenticeship on Youth: A Prospective Analysis*. *Journal of Research on Adolescence*, Vol. 6.
- Hanf, G. & Rein, V. (2007). *European and National Qualification Frameworks- A Challenge for Vocational Education and Training in Germany*. *European Journal of Vocational Training*.
- Harbison, F. 1973. *Human resources as the wealth of nations*. New York: Oxford University Press.
- Harrison, R. and Kessels, J. W. M. (2004). *Human Resource Development in a Knowledge Economy: An Organisational View*. New York: Palgrave Macmillan.
- Hernandez, H. et al (2001). *Impact of technological and structural change on employment. Prospective analysis 2020*. (Report EUR 20131). Brussels: European Commission. Retrieved 19 January, 2004: <ftp://ftp.jrc.es/pub/EURdoc/eur20131en.pdf> in Spottl, G. & Becker, M. (2004). *ICT Practitioner Skills and Training: Automotive Industry*. CEDEFOP Panorama Series; 91.Luxembourg. Publication of the European Communities.
- Heinz, W. R. (2002). *Transition Discontinuities and the Biographical Shaping of Early Work Career*. *Journal of Vocational Behavior*.



- Higgs, J., Horsfall, D. & Grace, S (2009). *Writing Research on Practice*. Volume 1. The Education for Practice Institute, Charles Sturt University, North Parramatta, Australia.
- Hoepfl, M. C. (1997). Choosing qualitative research: A primer for technology education researchers. *Journal of Technology Education*, 9(1).
- Hoepfner, H. & Koch, H. (2004a). *Self-reliant Training in Technical Education and Vocational Training (TEVT)*. Kuala Lumpur: DSP/GTZ.
- Hoepfner, H., & Koch, H. (2004b). *Work Processes and Learn and Work Assignments for TEVT*. Kuala Lumpur: DSP/GTZ/BOBB, Berlin. (Unpublished).
- Hoepfner, H.D & Koch, H (2005). *Work process and Learn & Work Assignments for NDTs*. BOBB Berlin, Germany. Dual System Project (DSP). Kuala Lumpur.
- Howell, D. (2000). *The Skills Myth*. The American Prospect. Volume 5, Issue 18.
- Hsieh, H.-F., & Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9).
- Hughes, R.E. (2003). *Skills or diploma? The Potential Influence of Skill-Based Pay Systems on Sources of Skills Acquisition and Degree Programs*. Journal of Work Study. 52(4).
- Huys, R, Rick, K.D & Vandenbrande, T (2005). *Enhancing Training Opportunities at Work*. Katholieke Universiteit Leuven.
- Hwang, G. H. (2003). *Information and Communication Technologies and Changes in Skills*. International Journal of Manpower.
- Illeris, K. (2003). *From Vocational Training to Workplace Learning*, paper from CRLC conference proceedings, Experiential: community: work-based: researching learning outside the academy, Glasgow: Glasgow Caledonian University.
- Illeris, K. (2004). *Adult Education and Adult Training*. Copenhagen: Roskilde University Press/Malabar, FL: Krieger Publishing.
- Illeris, K. (2007). *How We Learn: Training and Non-Training in School and Beyond*. London: Routledge.
- ILO (1986). *Vocational Training: Glossary of Selected Terms*. Geneva: ILO
- ILO (1998). *World of Employment Report, 1998-99*. World of Work the Magazine of the ILO. Geneva.



- ILO (2000). *Training for Employment: Social Inclusion, Productivity and Youth Employment*. Human resources training and development: Vocational Guidance and Vocational Training. Retrieved 20 March, 2010, from <http://www.ilo.org/public/english/standards/relm/ilc/ilc88/rep-v.htm>.
- ILO (2005). *National Qualifications Framework Malaysia*. International Labor Office (ILO). Retrieved 07 August, 2009 from http://www.ilo.org/public/english/employment/skills/hrdr/init/mal_7.htm.
- ILO (2007). *Employability: Education, Skills Development and Technology*. Issue paper for Session 1. Retrieved 20 March, 2010, from http://www.ilo.org/global/meetings-and-events/WCMS_084180/lang-en/index.htm.
- ILO (2008). *Improving Skills Recognition, Qualification, Quality and Qualification System*. Regional Skills and Employability Program in Asia and the Pacific (SKILLS-AP). Songkla, Thailand.
- ILO (2009). *Researching NQFs: Some Conceptual Issues*. Employment Sector: Employment Working Paper No.44. Geneva.
- ILO (2010). *Background Case Study on Malaysia Post-Compulsory Education and Lifelong Training*. International Labor Office (ILO): Melbourne, Australia.
- InWEnt (2003). *Competency-based training Compilation of seminar subject matter: Training the trainers*. Capacity Building International, Germany. Retrieved 07 May, 2010, from http://star-www.inwent.org/starweb/inwent/docs/Lehrbrief_01_engl.pdf.
- Jailani, M.Y., Wahid, W.A., Noraini, K. & Ghazali, S (2006). *Approaching the Change: KUITTHO TVE Master Program*. Transnational Symposium-Vocational Education and Training (TVET): Curriculum Development and Standard. KUITTHO, Johor.
- Jajri, I (2007). *Determinants of total factor productivity growth in Malaysia*. Journal of Economics Cooperation. 28.
- James, P. S (1979). *The Ethnographic Interview*. New York, NY: Holt, Rinehart and Winston.
- JICA (2007). *Study on Basic Knowledge of Student in Vocational Schools in Malaysia*. Final Report. Japan International Cooperation Agency (JICA). PE Research Sdn. Bhd. Malaysia.



- Johnson, S. & Burden, T. (2003). *Young People, Employability and the Induction Process*, the Joseph Rowntree Foundation, Policy Research Institute, Leeds Metropolitan University, UK.
- JPA, 2010. *Kelayakan Sijil Kemahiran Malaysia bagi maksud pelantikan perkhidmatan awam*. Pekiling Perkhidmatan Awam Malaysia Bilangan 1 Tahun 2011. Kerajaan Malaysia.
- Keating, J. (2010). *Qualifications Frameworks: Implementation and Impact Background: Case Study on Malaysia*. University of Melbourne Centre for Post-Compulsory Education and Lifelong Training. International Labor Office (ILO).Skills and Employability Department. Melbourne.
- King, J. & Kraemer, K. (1985). *The dynamics of computing*. New York: Columbia University Press.
- Klieme, E. et al. (2004). *The Development of National Educational Standards: An Expertise*. Berlin: Bundesministerium für Bildung und Forschung.
- Kreuger, R.A. (1988). *Focus groups: A practical guide for applied research*. London: Sage.
- Kruse, W. (1986). *Von der Notwendigkeit des Arbeitsprozess-Wissens*. In: Schweitzer, J. (Ed.): *Bildung für eine menschliche Zukunft*. Weinheim und München. In *Re-Engineering Dual Training – The Malaysian Experience*. Frankfurt 2008.
- Kvale, S. (1983). *The qualitative research interview: A phenomenological and a hermeneutical mode of understanding*. *Journal of Phenomenological Psychology*, 14.
- Kvale, S. (1996). *Interviews An Introduction to Qualitative Research Interviewing*. Sage Publications.
- LAN (2007). *Garis panduan Sistem Kredit Kerangka Kelayakan Malaysia*. National Accreditation Board (NAB).
- Last, J. (Ed.). (2001). *International epidemiological association. A dictionary of epidemiology* (4th ed.). New York: Oxford University Press.
- Lauzackas, R & Tutlys, V (2007). *Modelling the National Qualification Framework of Lithuania into the European Qualification Framework*. *European Journal of Vocational Training*.



- Lee, K.H., Quek, A.H, & Chew, S.B. (2001). *Education and Work: The State of Transition*. Faculty of Education, University of Malaya, University Malaya Publication.
- Lee, T. W.; Mitchell, T. R.; and Sablynski, C. J. (1999). *Qualitative Research in Organizational and Vocational Psychology, 1979-1999*. Journal of Vocational Behavior 55, no. 2.
- Levy, S. (1988). *Information technologies in universities: An institutional case study*. Unpublished doctoral dissertation, Northern Arizona University, Flagstaff.
- Leyden, G (2008). *Unemployment in Brussels: between skill mismatch and job competition: about the need to combine selective and comprehensive employment policies in the Brussels-Capital Region*. The e-journal for academic research on Brussels. Issue 14.
- Lincoln, Y.S & Guba, E.G (1985). *Naturalistic Inquiry*. Thousand Oaks. CA: SAGE Publication
- Lincoln, Y. S & Guba, E, G (2000). *Paradigmatic Controversies, Contradictions, and Emerging Confluences*. In N.K Denzin & Y.S. Lincoln (Eds.). *Handbook of Qualitative Research (2nd Ed.)* Thousand Oaks, CA: SAGE Publications. Inc.
- Lofland, J. & Lofland, L (1995). *Analyzing Social Settings: A Guide to Qualitative Observation and Analysis*. Belmont, CA: Wadsworth
- Loose, G. (2002) *How to Link and Match German TVET Concept with Anglo-Saxon CBET? Dual System Project/ GMI Malaysia*.
- Loose, G., Spöttl, G. & Yusoff, M.S. (2003). *Re-engineering- Dual Training. Malaysia Experience*. GTZ-GMi. Malaysia.
- Loose, G., Spöttl, G., Yusoff, M. (2008). *Re-Engineering Dual Training – The Malaysian Experience*. Frankfurt.
- M. Aslam, G.H & M.Asan, G.H (2003). *Development Planning and Regional Imbalances in Malaysia*. School of Economics, Universiti Utara Malaysia.
- M. Najib, A. R (2009). *Speech Budget 2010*. Dewan Rakyat. Kuala Lumpur.
- M. Rosli (2006). *The Automotive Industry and Performance of Malaysia Auto Production*. Journal Economics Cooperation 27, 1(2006) 89-114.
- M. Sahandri and Saifuddin (2009). *Generic Skills in Personnel Development*. European Journal of Social Sciences. 11(4).



- Maclean, R (2007). *Vocational and Higher Education: Issues, Concerns and Prospects*. UNESCO-UNEVOC, International Center for Technical and Vocational Education and Training. Bonn, Germany.
- Maehler, J. (2005). *Occupational Standard in Germany*. Description of Vocational Trainer. Leonardo da Vinci. Icon Institute, Cologne, Germany.
- Malaysia (1991). *The Report of the Cabinet Committee on Training: Training for Industrial Development – Challenges for the Nineties*. Kuala Lumpur: Economic Planning Unit / Ministry of Education.
- Malaysia (1996). *Education Act 1996: Act 550*.
- Malaysia (2001a). *The Eighth Malaysia Plan, 2001-2005*. Kuala Lumpur: Economic Planning Unit, Prime Minister's Department.
- Malaysia (2001b). *The Third Outline Perspective Plan, 2001-2010*. Kuala Lumpur: Economic Planning Unit, Prime Minister's Department.
- Malaysia (2004). *Skills Development Fund Act 2004: Act 640*.
- Malaysia (2006a). *National Skills Development Act 2006: Act 652*.
- Malaysia (2006b). *The Ninth Malaysia Plan, 2006-2010*. Putrajaya: Economic Planning Unit, Prime Minister's Department.
- Malaysia (2007). *Malaysia Qualification Agency Bill 2007*.
- Malaysia (2010). *The Tenth Malaysia Plan, 2006-2010*. Putrajaya: Economic Planning Unit, Prime Minister's Department.
- Marshall, M.N (1996). *Sampling for qualitative research*. Oxford University Press. Vol.13. No.6.
- Maxwell, J.A (1996). *Qualitative Research Design: An Interactive Approach*. SAGE Publications, International Educational and Professional Publisher, London.
- Maykut, P. & Morehouse, R. (1994). *Beginning Qualitative Research: A philosophic and practical guide*. London: Falmer Press.
- Mays, N. & Pope, C. (1995). *Rigour and Qualitative Research*. British Medical Journal (International). 311, 6997.
- McAlinden, S. P. *et al.* (2000). *Michigan Automotive Partnership Research Memorandum No.2*. Michigan, UMTRI Report No. 2000-24-2.
- McNamara (1999). *PhD. General Guidelines for Conducting Interviews*. Minnesota.



- Merriam, S.B. (1988). *Case study in education: A qualitative approach*. San Francisco: Jossey- Brass.
- Merriam. S (1998). *Qualitative research & case study application in Education*, San Francisco: Jossey-Bass.
- Merriam, S.B (2001). *Qualitative Research and Case Study Applications in Education*. Revised and Expanded from *Case Study Research in Education*. San Francisco : Jossey- Brass.
- Merriam, S.B (2002). Introduction to Qualitative Research. In Merriam, S.B & Associate (eds.), *Qualitative Research in Practice: Example for discussion and analysis* (pp 3-17). San Francisco, CA: John-Wiley & Sons.
- MGCC (2010). *Sustainable Growth in the Automotive Industry in Malaysia*. Volume 16, No. 4 KDN PP 8818/3/2010. Malaysian-German Chamber of Commerce and Industry (MGCC).
- Miles, M. & Huberman, A. M. (1994). *Qualitative Data Analysis*. Thousand Oaks, CA: Sage Publications.
- MIDA (2009). *MIDA – shifting the nation into hi-technology*. Malaysian Industrial Development Authority (MIDA). Retrieved 20 April, 2010, from http://www.mampu.gov.my/c/document_library/get_file?uuid=4dd96fc8-0c3f-416b-9f4c-633aa9e208b2&groupId=10136
- MIDA (2010). *Business opportunities: Malaysia's automotive industry*. Malaysian Industrial Development Authority (MIDA) Retrieved 30 June, 2013, from, http://www.mida.gov.my/en_v2/uploads/Publications_pdf/BO_MalaysiaAutomotive/Automotive_FA.pdf
- Min, W. (1995). *Vocational education and productivity*. In M. Carnoy (Eds.), *International Encyclopedia of Economics of Education*. Oxford: Pergamon.
- MITI (2006). *Third Industrial Master Plan (IMP3) 2006-2020*. Malaysia toward Global Competitiveness. Malaysia of International Trade and Industry (MITI). Malaysia.
- MITI (2009), *Media release –review of National Automotive Policy*, 28 October. Malaysia of International Trade and Industry (MITI). Malaysia. Retrieved 30 June, 2013, from <http://www.miti.gov.my>
- MLVK (1992). *Minit Mesyuarat Majlis Latihan Vokasional Kebangsaan Bil. 4/92*, 9 December 1992, Kuala Lumpur. (Unpublished).



PTT AUTHM
PERPUSTAKAAN NASIONAL DAN RISET MAMPU

- MLVK (1994). *Panduan Pelaksanaan Persijilan Kemahiran Malaysia Melalui Sistem Pentauliahan (Edisi Kedua)*. Kuala Lumpur. (Unpublished).
- MLVK (2005). *Implementation of the National Dual Training System – Guides and Rules*. 2nd. ed. Putrajaya
- MLVK (2006). *Laporan Bengkel Analisa Pembangunan NOCC Berasaskan NOSS. Sepang, Mac 7-8*. Putrajaya: MLVK. (Unpublished).
- MoE (1965). *The Razak Report*. Kuala Lumpur, Malaysia: Ministry of Education (MoE) Government Printers.
- MoE (1967). *Report of the higher planning committee*. Kuala Lumpur, Malaysia: Ministry of Education (MoE). Government Printers.
- MoE (1988). *Technical and vocational education in Malaysia*. Kuala Lumpur, Malaysia: Ministry of Education (MoE). Bahagian Pendidikan Teknik dan Vokasional.
- MoE (2006). *Pelan Induk Pembangunan Pendidikan 2006-2010*. Rancangan Malaysia ke 9. Putrajaya.
- MoF (2002). *Report The Knowledge Based Economy Master Plan*. Putrajaya: Ministry of Finance.
- Mohamad, S. (2010). *Changing Professional Profile of Coach in Malaysia: The Implementation of National Dual Training System NDTs in Malaysia and its impact on the professional tasks of industry personnel commissioned with training*. Doctoral dissertation, University Tun Hussein Onn.
- MoHE (2004a). *Briefing by YB Dato' Shafie Salleh. The Malaysian Qualification Framework. Regulatory Strategy for Quality*. Ministry of Higher Education (MoHE).
- MoHE (2004b). *Quality Assurance Division*. Ministry of Higher Education (MoHR). Retrieved 21 June, 2010 from <http://apps.emoe.gov.my/qad/nqf.html>.
- MoHE (2007). *Ucapan YB Dato' Mustapa Mohamed. Majlis Pengistiharan Penubuhan Agensi Kelayakan Malaysia*. Ministry of Higher Education (MoHE).
- MoHE (2009). National Higher Education. Ministry of Higher Education (MoHE). Retrieved 05 August, 2009 from http://www.portal.mohe.gov.my/portal/page/portal/ExtPortal/Agencies/Study_in_Malaysia/National_Higher_Education_System.



- MoHR (2007a). *Labor Situation in Malaysia: Overview 2007/2008, 2001-2005*: Putrajaya: Ministry of Human Resources (MOHR).
- MoHR (2007b). *Malaysia Enhancing Job Strategy*. Putrajaya: Ministry of Human Resources (MoHR).
- MoHR (2008a). *Labor Situation in Malaysia: Overview 2008/2009*, Putrajaya: Ministry of Human Resources (MoHR).
- MoHR (2008b). *Master Plan Malaysian Occupational Skills Development and Training 2008-2020*. Ministry of Human Resources (MoHR), Selangor.
- MoHR (2008c). *National Action Plan for Employment (NAPE)*. Putrajaya: Ministry of Human Resources (MOHR).
- MoHR (2010). *Labor and Human Resources Statistics, 2008 -2009*. Putrajaya: Ministry of Human Resources (MoHR).
- MoLM (1990). *Labor and Manpower Report 1989/90*. Kuala Lumpur: National Printing Department. Ministry of Labor and Manpower.
- MoLM. (1987). *NITTCB in brief*. Kuala Lumpur, Malaysia: Lembaga Latihan Perindustrian dan Persijilan Ketukangan Kebangsaan. Ministry of Labor and Manpower.
- Morse, J. (1991). On the evaluation of qualitative proposals. *Qualitative Health Research, 1*(2).
- MPC (2009). *Productivity Performance of Malaysia, Key Productivity Statistic*. Malaysia Productivity Corporation (MPC). Retrieved 8 January, 2010 from www.mpc.gov.my.
- MQA (2008a). *Code of Practice for Program Accreditation (COPPA). An Overview of Malaysian Higher Education Quality Assurance System*. Roadshows Malaysian Qualification Framework: Malaysia Qualification Agency (MQA).
- MQA (2008b). *Proceedings of the Asean Quality Assurance Agencies Roundtable Meeting*. Collaboration for Quality Higher Education in Asean. Kuala Lumpur.
- MQA (2008c). *The Malaysian Qualification Framework*. Malaysian Qualification Agency (MQA). Kuala Lumpur.
- Mulhall. A (2003). *In the field on observation in qualitative research*. *Journal of Advanced Nursing* 41 (3).



PTA UTHM
 PERPUSTAKAAN TUNKU TUN AMINAH

- NAB (2006). *Malaysian Qualification Framework: Point of Reference and Joint Understanding of Higher Education Qualification in Malaysia*. Studies Awarded in Malaysia. National Accreditation Board (NAB).
- Nasser, F. M. (2001). *Selecting an Appropriate Research Design*. In *Research Pathways: Writing Professional Papers, Theses, and Dissertations in Workforce Education*, edited by E. I. Farmer and J. W. Rojewski, pp. 91-106. Lanham, MD: University Press of America.
- NEAC (2010). *New Economic Model for Malaysia: Part 1 Strategic Policy Direction*. National Economic Advisory Council (NEAC). Kuala Lumpur.
- NITTCB (1976). *National Industrial Trade Standards, Trade Testing and Certification: General Regulations*. Kuala Lumpur: NITTCB.
- N.komo, M (2000). *The National Qualification Framework and Curriculum Development*, Waterloo.
- Norton, R. E. (1997). *DACUM Handbook*. The Ohio State University. Columbus, Ohio (Second Edition).
- NVTC (2001). *National Skill Certification in Malaysia*. Kuala Lumpur: NVTC.
- NVTC (2005). *Implementation of the National Dual Training System – Guides and Rules*. 2nd. ed. Putrajaya.
- NVTC (2006). *“Directory of National Occupational Skill Standards (NOSS)”*. Putrajaya
- OECD (2003). *Learning for Tomorrow’s World First Result from PISA. Program for International Student Assessment (PISA)*. Retrieved 7 April, 2009, from <http://www.oecd.org/dataoecd/1/63/34002454.pdf>
- Pang, C.L (2007). *A Historical Account of Skills Training in Malaysia*. Malaysia Labor Review. Vol. 1. Putrajaya: Ministry of Human Resources (MOHR).
- Pang, C. L. (2010). *The Integration of the National Occupational Skills Standard (NOSS) and the National Dual Training System (NDTS) in Malaysia*. Doctoral dissertation, University Tun Hussein Onn.
- Patton, M.Q. (1987). *How to Used Qualitative Methods in Evaluation*. Newbury Park. CA: Sage Publication.
- Patton, M.Q. (1990). *Qualitative Evaluation and Research Methods (2nd)*. USA : Sage Publication.



- Patton, W. Q. (2001a). *Career Education; what we know, what we need to know*. ECEF Research Forum Report. Retrieved 7 April, 2009, from www.ecef.com.au/web.kmgateway.nsf/main_lookup.
- Patton, M.Q. (2001b). *Qualitative Research & Evaluation Methods (3rd.Ed.)*. Thousand Oaks. CA.
- Patton, M. Q. (2002). *Qualitative evaluation and research methods (3rd ed.)*. Thousand Oaks, CA: Sage Publications, Inc.
- Patton, M. Q. (2003). Qualitative Evaluation Checklist. Retrieved 12 August, 2008 from <http://www.wmich.edu/evalctr/checklists/qec/> .
- Paul, Low S. K (2002). Meeting the Needs of Industry. *Challenge to Training & Education Institutions*. Presentation in International Conference of Technical Education & Vocational Training. Kuala Lumpur. German Malaysian Institute & GTZ.
- Pretzlik, U. (1994) *Observational Methods and strategies*. Nurse Researcher 2(2).
- Proctor, R.W. and Dutta, A. (1995) *Skill Acquisition and Human Performance*, London: Sage.
- Raggatt (1988). *Quality Control in the Dual System of West Germany*. Oxford Review of Education, vol 14.
- Rahim, M. S, Abdul, R.M.M.A, Asnarulkhadi, A.S, Azimi, H, Sidik,M.N & Zakaria, K (2007). *Handbook on Social Skills and Social Values in Technical Education and Vocational Training*. Ministry of Human Resouces. Putrajaya.
- Rahman, M.D & Foo, W.T (2008). *Competence Based Education Framework*. Implications for Higher Education Process in Malaysia.
- Rashid, N.B. & Nasir (2003). *Lifelong Learning in Malaysia*. Paper presented at the International Policy Seminar, June 24-26. Seoul, Korea.
- Ramlee, M. and James, P. G. (1999). *The Role Education in Economics Development in Malaysia: Educators' and Employers' Perspectives*. Unpublish doctoral dissertation, Purdue University, West Lafayette, IN.
- Ramlee, M & Abu, A (2004). *Malaysia Transitions Toward a Knowledge-Based Economy*. The Journal of Technology Studies, Vol 30 (3), 51-61.
- Ramlee, M., Faridah, K., Norzain, A., Hamidah, Y. Wahab, M. & Sabri. T (2008). *K-Economy and Globalization - Are Our Students Ready*. Jurnal Personalia Pelajar Bil. 11 Jun/June 2008.



- Rasmussen, E. (2009). *Employment Relations in New Zealand*. Edition 2. ISBN: 9781877371530. AUT University.
- Rauner, F. (1993). *Zur Begründung und Struktur gewerblich-technischer Fachrichtungen als unversitäre Fächer*. In Bannwitz, F. Rauner (eds.) *Wissenschaft und Beruf. Berufliche*.
- Rauner, F. (1996), *Zweckfreie Berufsbildung in der Berufsschule*. In: Dederling, H. (ed.): *Handbuch zur arbeitsorientierten Bildung*, München Wien: Oldenbourg.
- Rauner, F (2005a). *Modern Apprenticeship and Curriculum Design*. ITB. Uni-Bremen. International Conference on Work Process Based Curriculum Design and Teacher Training for TVET Bremen.
- Rauner, F. (2005b). *Work process Knowledge and Development of Vocational Competence*. Institute Technology and Education (ITB), Bremen. Oman Conference.
- Rauner, F. (2007). *Practical Knowledge and Occupational Competence*. Institut Technik und Bildung (Institute of Technology and Education), University of Bremen.
- Reed J *et al.* (1996) A sampling strategy for qualitative research. *Nurse Researcher*. 3,4, 52-68.
- Rohs, M (2002). *Work process – Oriented Competence Development. Systematic Continuing Education in IT*. BMBF Public.
- Ruhm, C. J (1995). *The Extent and Consequences of High School Employment*. *Journal of Labor Research*.
- Ryan, P. (2001). *The School to Work transition: problems and indicators*. In A.N. Perret-Clermont, C. Pontecorvo. L.Resnick. T.Zittoun and B.Burge (Eds.), *Youth, Training and Society*, Cambridge, UK: CUP.
- Sachs, R. (1998). *Development of National Occupational Skills Standards (NOSS): Workshop- Job Analysis*. NVTC. Kuala Lumpur.
- Sampson, D.A (2002). *Remarks of U.S. Assistant Secretary of Commerce for Economics Development, 2002 Governor's Economics Development Conference*. Retrieved 18 April, 2009 from <http://www.umaine.edu/mcsc/>.
- Spady, W. (1994). *Outcomes-based Education: Critical Issues and Answers* The American Association of School Administration.



- SAQA (2006). Section 2: *The Role of Qualification Frameworks in the Harmonisation of Teacher Qualifications*. The Recognition of Teacher Qualifications and Professional Registration Status across Commonwealth Member States. South African Qualification Authority (SAQA). South Africa.
- Sarimah, A. R. (2005). *Motivasi, Gaya Pembelajaran dan Kebolehan Kognitif Pelajaran Sekolah Menengah Teknik*. Doctoral dissertation, University of Putra, Malaysia.
- Schmidt, H and Alex, L. (1997). *The Dual System of Vocational Education and Training in Germany*. In Bundesinstitut für Berufsbildung,; Vocational Training in Germany, 2000.
- Schunk, H. Dale (2000). *Training Theories, an Educational Perspective*. (3rd ed.). New Jersey: Prentice-Hall.
- Seng, L.W (2007). *Vocational Technical Education and Economics Development the Singapore Experience*. ITE paper No.9. Institute of Technical Education (ITE). Singapore.
- Senker, P. (1995). *Training Levies in Four Countries: Implications for British Industrial Training Policy*. A Report Prepared for the Engineering Training Authority, EnTra Publications. Watford.
- Sharipah, H.S. (2005). *Regulation of Cross-broader Education in Malaysia*. In the *Aftermath of librelization: Designing a common Framework for Public and Private Providers to Serve National Development Goals: South Africa*. UNESCO. Eugene Delacroix, Paris.
- Silverman, D. (1993) *Interpreting Qualitative Data*. Sage, London.
- Smith, E.A (2001). *The Role of Tacit and Explicit Knowledge in the Workplace*. Journal of Knowledge Management Volume 5. Number 4. MCB University Press. ISSN 1367-3270.
- Smitka, M. J., (1991). *Competitive Ties: Subcontracting in the Japanese Automotive Industry*. New York, Columbia University Press.
- Sondermann, T. (2005). The German Vocational Training Reform Act of 2005: What is new, what is different? Promoting Innovational Education and Training. BiBB.
- Spottl, G. (1996). *The Car Mechatronic– Development of a Future-oriented European Occupational Profile*. In Rauner, F. & Spottl, G. (Eds.). *The*



Automobile, Service and Occupation in Europe. Results of the European Automobile Conference, Luxembourg, 2-3 December 1994. Bremen: Donat Verlag.

Spottl, G. (2000). *Study on Work, Technology and Training in the Manufacturing Sector of Malaysia's Industry.* Report for *Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ, Germany).*

Spottl, G. (2004). *Work Process Orientation of the TEVT System and Consequences for NOSS – an Instrument for the Development of Occupational Profiles.* Flensburg: University of Flensburg.

Spottl, G. (2008a) “Learning Through Work Process- Challenges and the Shaping of Skills Requirement”. In Loose, G./ Spöttl, G./Yusoff, M.S. (2000). “*Re-engineering Dual Training – The Malaysian Experience*” Frankfurt 2008.

Spottl, G. (2008b). Symposium Session 7a – *Occupational Core Profiles-As European Approach, Paradigm Shift or Alternative to Actual ECVET concepts? A Critical Discussion.*

Spottl, G. (2009). *Moving from Principle to Implementation: European Quality Assurance Reference for VET (EQARF) and European Credit System for VET (ECVET).* Launching Conference Brussels.

Spottl, G. & Becker, M. (2004). *ICT Practitioner Skills and Training: Automotive Industry.* CEDEFOP Panorama Series; 91.Luxembourg. Publication of the European Communities.

Spottl, G. & Becker, M. (2008). *Work process analyses- An essential tool for qualification and curriculum research.* In G. Loose, G. Spottl, & Y. M. Sahir (eds). “*Re-engineering dual training – the Malaysian experience, 105-126.* Frankfurt am Main: Peter Lang.

Spottl, G., Heb, E. (2009a). *Core occupations as a building block for European Vocational Education and Training.* International Vocational Educational and Training. BiBB. Germany.

Spottl, G., Kuhn, S. & Loose, G. (2009b). *Development of a Sector Related Qualification Framework (SRQF): Practical Example: Car Sensitive Sectors.*

Spottl, G. & Gerds, P. (2002). *The Car Mechatronic; A European Occupational Profile. manual for Trainers and Teachers.* European Commission LENERDO DA VINCI. Universitat Flensburg.



- Spottl, G., Petersen, Willi; Heidegger, Gerald; Rauner, Felix (1994): *Arbeitsprozesswissen in der Berufsausbildung*. ITB-Diskussionspapier, Bremen.
- Stam, C. D. (2007), *Making sense of knowledge productivity: beta testing the KPenhancer*, Journal of Intellectual Capital, Vol. 8 No. 4.
- Stone III J.R. & Josiam, B. (2000). *The Impact of School Supervision of Work and Job Quality on Adolescent Work Attitudes and Job Behaviors*. The Journal of Vocational Education Research.
- Straka, G. A (2007). *Has Germany sacrificed its concept of competence at the altar of the EU?* University Bremen, Forschungsgruppe.
- Strauss, A. L. and J. Corbin. 1990. *Basics of qualitative research: Grounded theory procedures and techniques*. London: Sage.
- Tan, A.M. (2002). *Malaysian Private Higher Education: Globalisation, Privatization, Transformation and Marketplaces*. London: ASEAN Academic Press.
- Taylor, R. and Greenhalgh, T. (1997). How to read paper: Papers that go beyond numbers (Qualitative Research). Education and debate. BMJ 315: 740-743.
- The European Qualifications Framework (EQF). *Promoting workers' and learners' mobility between countries and facilitating their lifelong training*. Retrieved 02 May, 2008 from http://ec.europa.eu/education/lifelong-training-policy/doc44_en.htm.
- Tilak, J.B (2002). *Vocational Education & Training in Asia*. New Delhi: National Institute of Education Planning & Administration.
- Tuck Ron (2007). *An Introductory Guide to National Qualifications Frameworks: Conceptual and Practical Issues for Policy Makers*, Geneva, International Labor Office (ILO).
- Turnbull, P. et al., (1992). *Buyer-Supplier Relations in the UK Automotive Industry*. Strategic Management Journal. Vol 13, 1992, p 387-413
- V. Manen (1990). *Researching Level Experienced: Human Science for Action Sensitive pedagogy*. United State: University of New York Press.
- Wan Najib, W.D and Nurul Huda, H. (2007). *United State dominant investment in Penang*. Kuala Lumpur. Press Malaysia News Publication.
- W. Seman, W.A. (2005). *The New Sectors of Economics Growth: The Contributing Role of Technical and Vocational Education*. Presentation Paper in the



National Technical and Vocational Education Conference, Kuala Lumpur, Malaysia.

- W. Seman, W.A. (2007). To Inculcate Training Culture Smongst Malaysian Industry Through NDTs. Malaysia Labor Review. Vol. 1. Putrajaya: Ministry of Human Resources (MOHR).
- Weiss, K. (1990). *Perspective and Cultural Idiosyncrasies in an International Social Institution*. Vol 25 (1).
- Wikepeida (2009). *Malaysian Qualification Framework (MQF)*. Retrieved 07 August, 2009 from http://en.wikipedia.org/wiki/Malaysian_Qualifications_Framework#Development_of_the_MQF.
- Winterton, J. Delamare, F & Stringfellow, E. (2005). *Typology of knowledge, skills and competences: clarification of the concept and prototype*. Centre for European Research on Employment and Human Resources Groupe ESC Toulouse. Research report elaborated on behalf of Cedefop/Thessaloniki.Final draft. (CEDEFOP Project No RP/B/BS/Credit Transfer/005/04).
- World Bank (1997). *Malaysia: Enterprise Training, Technology & Productivity*. The World Bank Country Report. Washington DC: The World Bank.
- World Bank (2009). *Malaysia Productivity and Investment Climate Assessment Update*. Poverty Reduction and Economic Management Sector Unit East Asia and Pacific Region. Report No. 49137-MY.
- Yin, R. (1984). *Case study research: Design and methods* (1st ed.). Beverly Hills, CA: Sage Publishing.
- Yin, R. (1989). *Case study research: Design and methods* (Rev. ed.). Newbury Park, CA: Sage Publishing.
- Yin, R. (1994). *Case study research: Design and methods* (2nd ed.). Thousand Oaks, CA: Sage Publishing.
- Yin, R. (2000). Rival explanations as an alternative to reforms as experiments. In L. Bickman (Ed.) *Validity and social experimentation: Donald Campbell's legacy*. Thousand Oaks, CA: Sage.
- Yogeessvaran. K (2005). Addressing Skills Gap: Malaysian Case Study. Session 3: Skills for Competitiveness in East Asia. Economic Planning Unit (EPU).



- Young, M. (2002). *Contrasting approaches to the role of qualifications in the promotion of lifelong training*, In K. Evans, P. Hodkinson & L. Unwin (eds) *Working to Learn: transforming training in the workplace*. Kogan Page, London.
- Young, M. (2003a). *National Qualifications Frameworks as a global phenomenon: a comparative perspective*. *Journal of Education and Work*.
- Young, M. (2003b). *Special Issue on "National Qualifications Framework"*. *Journal of Education and Work*.
- Young, M. (2004). *Toward a European Qualification Framework: Some Cautionary Observations*. Paper Present Symposium on European Qualification, Strasbourg.
- Young, M. (2005). *National Qualification Frameworks: The Feasibility for Effective Implementation in Developing Countries*. International Labor Office (ILO). Working Paper No.22, Skills and Employability Department.
- Young, M & Allais, S (2009). *Conceptualizing the Role of Qualification in Education Reform*. NQF Research: Discussion Documents.
- Yusop, A. H., Jailani, M. Y. & Noraini, K (2009). *Readiness to be K-workers among Students of Engineering Education Institution in Malaysia*. UTHM. Johor.
- Zakaria, A. (1988). *Perceptions of industrial training and employability skills: A comparative study of the vocational school and the MARA vocational institute students in Malaysia*. Doctoral dissertation, University of Pittsburgh.
- Zhang, Y. (2006). *Content Analysis (Qualitative, Thematic)*. Retrieved 15 January, 2010 from <http://ils.unc.edu/~yanz/Content%20analysis.pdf>.
- Zanifa, M.Z. (2007). *Malaysian Government Policies on Human Resources Developmet: Toward Meeting the Needs of the Knowledge-based Economy*. Re-Engineering Dual Training. The Malaysia Experience. GTZ & GMI. Malaysia.
- Zharir, K & Mansor, J (2000). *Economy Malaysia: Issue and Challenges*. University Kebangsaan Malaysia (UKM). Bangi, Selangor, Malaysia.
- Zita, M. F., Mohamed Salleh M. Y., and Yang Farina, A. A. (2007). Quality assurance, credit transfer, student mobility and mutual recognition. *Paper presented at European Higher ducation Fair: Malaysia*, Kuala Lumpur, Malaysia.



- Zita, M. F (2009). *The Malaysian Qualifications Framework, presentation to the Workshop on Recognition of Higher Education Qualifications in Asia Pacific Region*, Hotel Manila, Manila.
- Zulhaidi M. J. et al., (2012). *Review of the National Automotive Policy on Car Maintenance Issues: Malaysia's Automotive Ecosystem Explained*. MIROS Review Report, 02/2012.
- Zuniga, F.V. (2003). *Lifelong Learning: Experiences towards the development on NQFs in Latin America and the Caribbean*. CINTERFOR/ILO: Uruguay.



PTTA UTHM
PERPUSTAKAAN TUNKU TUN AMINAH