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- | | | |
|--|----|--|
| <i>Yuji Taniguchi</i> | 1 | Occupational Capability Evaluation System Development and Related Issues in Japan -The Significance of Changes Made Since the 80s- |
| <i>Kuei-Chih Chuang
Hung-Ju Tsa</i> | 15 | A Case Study of the Funeral Mortician Services on Transition Effects for Adult Vocational Training Program in Taiwan |
| <i>Chi-Wei Li
Ruey-Gwo Chung</i> | 31 | A Study on Web-based Micro-Entrepreneur Competency Analysis: Using the Retail -3C Marketing in Taiwan as an Example- |
| <i>Tongji Li
Remy M. J. P. Rikers</i> | 45 | Perceived Deliberate Practice Activities of Chinese Vocational School Teachers |
| <i>Chun-Pong Wong
Chung-Shan Sun²</i> | 59 | A Study of Leadership Qualities in Vocational Education of Master Mariner |

<p><i>Kazunori Shimada</i> <i>Yasushi Ichihara</i> <i>Yoichi Miyagawa</i> <i>Jun Moriyama</i></p>	<p>71</p>	<p>Structure of Students' Consciousness at the Time of Entrance Technical High Schools in Japan</p>
<p><i>Zi-Long Yin</i> <i>Seung-Kwon Nam</i> <i>Won-Sik Choi</i></p>	<p>81</p>	<p>Technological Thinking Disposition of Meister High School Students</p>
<p><i>Seri Bunian Mokhtar</i> <i>Saemah Rahman</i> <i>Ramlee Mustapha</i> <i>Mohd Yusof Husain</i></p>	<p>95</p>	<p>The Influence of Learning Environment on Students' Learning Approaches</p>
<p><i>Wei Keh Chin</i> <i>Dk Hj Siti Nur</i> <i>Bahrina Binti PG HJ</i> <i>Duraman</i></p>	<p>109</p>	<p>Factors Influencing the Career Choice of Business and Finance Students from the Vocational and Technical Education in Brunei Darussalam</p>
<p><i>Wei-Te Liu</i> <i>Wen-Po Yen</i> <i>Yui-Ming Lai</i></p>	<p>121</p>	<p>The Relationship between Career Self-Concept and Occupational Awareness of Vocational High School Students in Taiwan</p>
<p><i>Seung-Il Na</i> <i>Seung-Hwan Jeon</i></p>	<p>137</p>	<p>International Trends and Implications of the National Qualifications Framework</p>



Occupational Capability Evaluation System Development and Related Issues in Japan -The Significance of Changes Made Since the 80s-

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ABSTRACT This study was conducted to clarify the development and characteristics of a public occupational capability evaluation system in relation to vocational education training (VET) policies in Japan. The scope of occupational capability evaluation in the study was limited to education and training concerning occupations (i.e., VET) rather than encompassing evaluation frameworks for education and training as a whole (like the European Qualifications Framework (EQF)). The range adopted was that of human resource development by labor administration in consideration of the actual situation in Japan. The method of study involved examining labor administration views relating to development of the public occupational capability evaluation system based on R. Dore's question of whether more benefit is gained by skill buyers or skill sellers. The results revealed that the view regarding measures for profit consideration in occupational capability evaluation had shifted from skill buyers to skill sellers with a turning point in the 1980s.

KEY WORDS occupational capability evaluation, lifelong learning, company-led, individual-led, human resources development

Introduction

This study was conducted to clarify the development and characteristics of a public occupational capability evaluation system in relation to vocational education training (VET) policies in Japan.

The reorganization and creation of occupational capability evaluation systems is today progressing in many countries. According to the European Training Foundation (ETF), 126 nations were involved in some stage of the National Qualifications Framework (NQF) as of 2011. Two background factors are considered to contribute to this situation. The first is the acceleration of labor market globalization due to the increased establishment and progress of multilateral economic partnership agreements,

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and the second is the international penetration and proliferation of the lifelong learning concept. In this context, it can be argued that having an occupational capability evaluation system is important in Japan. It is generally said that occupational capability evaluation and VET are two sides of the same coin. That is, VET systems may prescribe aspects of occupational capability evaluation, while occupational capability evaluation systems may prescribe aspects of VET. It is therefore patently clear that occupational capability evaluation and VET have relevance. However, it remains unclear how Japan's occupational capability evaluation system has developed in relation to VET and what characteristics it has.

The targets of previous studies on occupational capability evaluation in Japan have included skill tests in some cases but not in others. This study's occupational capability evaluation, which was intended to assess the degree of progress and the effects of VET and provide validation of the results, is equivalent to the concept of qualifications as used in Europe. The OECD defines the term "qualification" as follows:

"The formal outcome (certificate, diploma or title) of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards and/or possesses the necessary competence to do a job in a specific area of work. A qualification confers official recognition of the value of learning outcomes in the labor market and in education and training. A qualification can be a legal entitlement to practice a trade."

The term "occupational capability evaluation" as used in this study includes skill tests and occupational qualifications in a narrow sense. However, it is limited to the range of education and training concerning occupations (i.e., VET) rather than encompassing evaluation frameworks for education and training as a whole (like the European Qualifications Framework (EQF)). In addition, rather than being fundamentally based on labor administration or educational administration, the study adopted the range of human resource development by labor administration in consideration of the actual situation in Japan.

Literature Review

Previous studies in the field have tended to focus on occupational qualifications in Japan, of which there are two types (private and public) as in other countries. In addition, the ambiguity of the boundary between these types and officially approved occupational capability (skill tests) make the related situations complex and varied. Progress has therefore been made in studies by limiting the range of areas examined (for example, limiting the focus to public occupational qualifications or excluding skill tests). The results of a search for papers containing the keywords *Shokugyo noryoku hyoka* (occupational capability evaluation), *Shokugyo shikaku* (occupational qualification) and *Gino kentei* (skill test) on CiNii (the academic database of the National Institute of Informatics) show a rapidly increasing number of hits after the 90s (see Fig. 1). Based

on these outcomes, the question of whether there was a significant change in the outlook of labor administration concerning occupational capability evaluation from the 80s to the 90s can be examined.

The main results of past studies to elucidate occupational capability evaluation in relation to VET are summarized below.

R. Dore & M. Sako (1989,134–160) clarified the characteristics of occupational qualifications in relation to education and training in Japan based on comparison with Britain. They did not distinguish occupational qualifications from occupational capability evaluation, and regarded public skill tests as the typical system of Japanese occupational qualification examinations. The authors argued that there was a difference in occupational qualifications and skill tests in Japan and Britain based on their recognition that authorization bodies and the functions of occupational qualifications had developed based on the historical situations of each country. While typical authorization bodies for occupational qualifications in Japan are skill buyers (i.e., employers) or their representatives (i.e., associations or organizations related to employers), in Britain a peer-approval style of occupational/professional organizations involving skill sellers has progressed for many years.

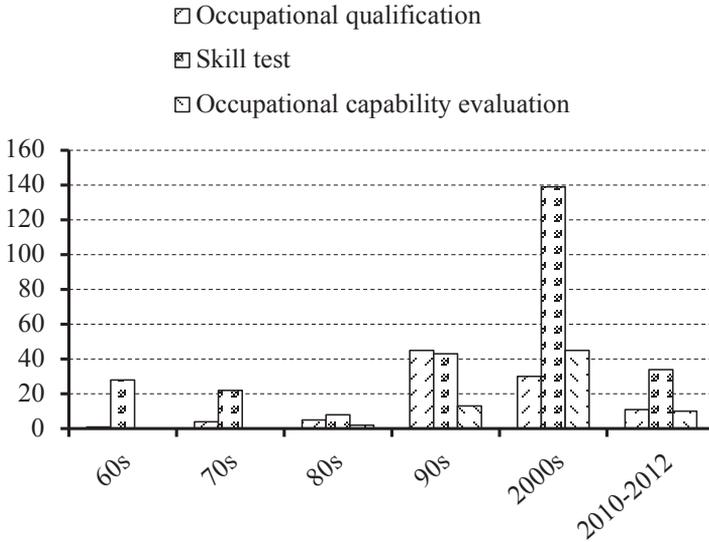


Figure 1. Numbers of Papers Containing Particular Keywords

Wada (1968, 296–297) argued that the practice of carrying out skill tests was associated with the private sector in Europe, whereas in Japan it was associated with the heads of government bodies based on a single principle. In addition, it was pointed out that skill tests in Japan had a weaker correlation to the completion of training or post-training treatment than in Europe, where success in skill tests meant the completion of training and was related to post-training treatment.

Yoda (1988) critically examined the significance of qualification reform, the shift to a lifelong learning system and individual-led occupational skill development in a labor policy detailed in a report by the Provisional Council on Education Reform. This examination was conducted not only in relation to public occupational qualifications but also in relation to skill tests based on the setting of the term "qualification" as idiomatic and ambiguous and placing it in square brackets.

After clearly distinguishing occupational qualifications and skill tests and also assigning public and private category classifications to each, Sasaki (1993a, 1993b) sought to clarify the social characteristics of occupational qualifications and skill tests and considered the significance of public occupational qualifications in high school vocational education and public skill tests.

A paper on a study by Imano (1998) described the relationship between the occupational qualification system and education/training from a business administration viewpoint. It highlighted the importance of qualifications that function to support human resource development, but pointed out that in-company qualifications were deficient in terms of social distributability based on the tendency of the labor market in the 90s. The author also proposed the establishment of an occupational qualification system in which a great variety of qualifications are arranged in consideration of occupations and capability levels.

Research focusing on occupational capability evaluation was begun as part of policy research efforts by a public research organization at the end of the 90s. Yahata and others carried out research with the aim of clarifying the actual conditions of corporate occupational capability evaluation systems by limiting consideration to the need for such evaluation in companies. A questionnaire survey on corporate personnel affairs generated replies from around 1,200 companies, and the results were used to analyze the use of corporate qualifications and skill tests, clarify the evaluation of qualifications and skill tests by companies, assess the classification and roles of such qualifications and skill tests, and determine the utility value of a socially cross-sectional occupational capability evaluation system (Yahata 1999).

Methodology

From the result (Fig. 1) of the paper search on the database "CiNii", the hypothesis whether occupational capability evaluation of Japan had a certain change from the 1980s to the 90s can be built up. So, this study verifies whether there was a change and investigates what kind of change it was if there was a change. The verification is conducted by the method of confirming the view of policy along with historical development of the measures concerning human resources development and occupational capability evaluation.

The theoretical framework based in the verification is the difference of the vocational capability evaluation system in Britain and Japan which R. Dore & M. Sako argued. That is, they pointed out a difference between Britain and Japan in that

qualification authorization bodies are occupational/professional organizations in Britain, while they tend to be state- or employer-run in Japan. And they explained that this difference originated in the development process and the contrasting concepts that occupational capability evaluation systems should work for skill sellers in Britain but for skill buyers in Japan.

The next section discusses the views of labor administration from the perspective pointed out by R. Dore & M. Sako based on the development of the public occupational capability evaluation system.

The View of Occupational Capability Evaluation in VET Policy

Pre-World War II

The developments listed in Table 1 are seen as the beginning of occupational capability evaluation systems, and can be thought of as having been implemented in response to the needs of personnel management as skill buyers. Also prominent as background to this is the characteristic of occupational qualification development by which main occupational qualifications were formed under a system that made the state an authorization body in place of skill buyers (Tsuji 2000).

Table 1

Pre-World War II Occupational Capability Evaluation

Year	Development
1924	Study of Skill Test (<i>Gino kensa</i>) in the Document Material Division of Mitsubishi Limited Partnership (Mitsubishi Goshi Gaisha)
1936	Establishment of plan for Skill Selection (<i>Gino senko</i>) at Nagoya City employment Agency (Nagoya-shi Shokugyo Shoukaijo) *Adoption of same plan at Tokyo Central Employment Agency
1938	Formulation and use of Skill Test (<i>Gino kensa</i>) at Shipping Technical research Institute
1939	Start of Skill Test System (<i>Gino kensa seido</i>)
1940	Enactment of National Occupational Capability Inspection Rule (<i>Kokumin shokugyo noryoku kensa kisoku</i>) (Ministry of Health and Welfare Ordinance No. 27)
1940	Establishment of Mechanics Skill Test System (<i>Kikai gijutsusha kentei seido</i>)
1941	Enactment of Mechanics Skill Test Decree (<i>Kikai gijutsusha kentei rei</i>) (Decree No. 644)

Period of Vocational Training Law Enactment

The Extraordinary Vocational Training System Council established in the process of the Vocational Training Law’s enactment highlighted the necessity for a vocational training system from the viewpoint of industrial development in the Reply Regarding

Establishment of a Vocational Training System (December 6, 1957) as follows:

"There is strong demand for the promotion of technology education these days. In parallel with such promotion, it is a matter of urgency to aim for the improvement of skill levels on production sites and foster the development of skilled laborers based on vocational training to support the progress of industrial advancement." (Rodoshō 1975, 20)

In regard to establishing a skill test system as part of a synthetic vocational training setup, the reply also described the state of the system based on a consistent logic of industrial development as follows:

"By authorizing skills resulting from vocational training, it is especially necessary to promote workers' motivation to acquire skills and raise their abilities, and to aim for the improvement of skill levels in industry." (Rodoshō 1975, 21)

It can therefore be said that the reply placed more emphasis on industrial circles as skill buyers than on the function for skill sellers.

Subsequently, the Skill Test Division of the Ministry of Labor's Vocational Training Bureau investigated the intentions of industrial circles in regard to a skill test system from November to December 1966 in collaboration with all industrial manpower development associations (*sangyojin noryoku kaihatsu kyōkai*) (Rodoshō 1975, 55–57). It can thus be seen that there was no change involving the placement of more emphasis on industrial development in the process of the new Vocational Training Law's enactment in 1969.

However, the fundamental views of labor administration in Japan on the state of the skill test system and the vocational training system followed the European example. When the Employment Measures Law was established in 1966, Employment Security Bureau Director General Motoharu Arima expressed a negative view of the Japanese seniority-based employment system, saying, "Correction will be an indispensable requisite in forming a modern labor market (Arima 1966, 66)." Internal labor market theory, which outlines the seniority-based system as supporting skill formation, was not well known in Japan at the time. According to Nomura (2007), internal labor market theory was established after 1974 when Sumiya (1974, 2–10) introduced Doeringer & Piore's Internal Labor Markets and Manpower Analysis.

Period of the New Vocational Training Law

The new Vocational Training Law enacted in 1969 stated, "Vocational training and skill tests must be carried out on the basis of relations close to mutual" (Article 3, Clause 6), and was intended to expand the skill test system. The main measure was the skill test authorization system established in October 1973, which was set up with an occupational description clarifying that it was not intended to compete with existing public skill tests, and the Labor Minister authorized the system's status as a non-profit entity. That is, as the system does not benefit a specific company or enterprise, it can be seen as filling in gaps left by public skill tests. The number of occupational tests authorized under the system had reached 21 by 1988, and 9 further occupational

descriptions (e.g., bathtub equipment construction and metallic mold manufacture) were subsequently shifted to public skill tests (Rodosho 1991, 299–305). Although there were some non-profit institutions among the organizations authorized under the system, almost half were industrial organizations made up of companies in similar trades. It can therefore be said that the skill test authorization system also profited skill buyers.

A particular point to note in regard to the new Vocational Training Law was its introduction of the lifelong training concept. In this way, the law expanded the range of vocational development (which had previously consisted mainly of public vocational training and authorized in-company training under the previous law) to "all training that develops or raises the capabilities of skilled laborers by promoting skills required for mastery of the occupation (Rodosho 1971, 69)." Although the first vocational training master plan (a five-year initiative introduced in 1971) did not include specific measures in regard to skill tests for lifelong training, the second (a five-year initiative introduced in 1976) mapped out the future direction of skill tests for the realization of lifelong training as follows:

"There is a need for collaboration in regard to public skill tests, skill evaluation systems in the private sector, other public qualifications and similar toward the development of a system in which all workers engaged in skilled occupations can undergo examination based on individual skill grades." (Shokugyo Noriyoku Kaihatsu Gyoseishi Kenkyukai 1999, 180)

These points highlight the approach of the first comprehensive occupational capability evaluation system. However, this was limited to skilled occupations. Although the scope of skill tests carried out under the Vocational Training Law expanded in terms of the number of occupations they covered (Table 2), the range of the occupational descriptions was in fact still restrictive. Accordingly, in order to develop lifelong education in the new wider range of vocational training created by the law, such training and skill tests to be performed on the basis of close mutual relations required implementation in conjunction with other skill evaluation systems.

During deliberations on the revision of the Vocational Training Law in 1978, Labor Minister Katsushi Fujii said, "The revision is intended to promote lifelong training and lifelong skill evaluation as part of the basic philosophy of vocational training and skill tests" in justification of the proposed change. This was the first use of the term "lifelong skill evaluation (Rodosho 1971, 183)." In this way, the Vocational Training Law revision of 1978 expanded the range of vocational training from "all training that develops or raises the capabilities of skilled laborers by promoting skills required for mastery of the occupation" (1969 law) to "all training that develops or raises the capabilities of skilled laborers by promoting skills, knowledge and other abilities required for mastery of the occupation" (1978 revised law) (Rodosho 1979, 86) to further advance the lifelong training promoted under the original law.

Table 2

Occupations Covered by the Public Skill Test

Year	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
Number	5	11	17	23	29	35	43	51	54	59
Year	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Number	64	83	98	118	65*	75	82	88	90	94

* Unification of occupational descriptions

That is, the possibility of lifelong training was extended by eliminating vocational training content and removing limitations on who could receive training. The law also stated, "Appropriate evaluation of skills required in occupations at every stage reached should be held as a basic philosophy" (Article 3, Clause 1), and indicated the direction that skill tests should take in line with the concept of lifelong training.

As technology, skills and knowledge specific to individual companies expanded in leaps and bounds due to technical progress, it became difficult to include evaluation of company-specific occupational abilities in skill tests administered by the national government. Against such a background, the third vocational training master plan of April 1981 set forth an initiative to introduce an authorization system for official approval to be given by industrial organizations. Its purposes were (1) to complement the public skill test system, (2) to strengthen compatibility between the public skill test system and the private occupational capability evaluation system, and (3) to promote a combination of the occupational capability evaluation system and corporate handling. It advanced compatibility with private-sector skill test systems promoted under the above-mentioned second vocational training master plan. A study group on in-company skill test systems established to examine the plan reported that authorizing in-company skill tests would be a significant move, and an in-company skill test authorization system was subsequently created in December 1984. However, in-company skill tests tailored to individual companies were developed by those firms in response to the needs of personnel management and other considerations (i.e., for convenience of operation) in cases where, for instance, special skills not covered by public skill tests were required or where an original basis of evaluation for a company was needed. Although authorizing in-company skill tests publicly served to improve the authenticity of test results, the fact that they are in-company tests means that there was no corresponding change in the structure benefiting skill buyers.

Period of Human Resources Development Promotion Law Enactment

The Vocational Training Law was revised in 1985 to create the Human Resources Development Promotion Law. This new law was founded on a November 1984 proposal by the Corporate Education Study Group (chaired by personnel management expert Kenji Okuda) entitled "The subjects and direction of in-company human resource development in the new age – the goal of new learning-based companies. This legal

revision further reinforced the measures of the 1978 revised Vocational Training Law, which set corporate education/training at the core of vocational training. While the Ministry of Labor was promoting the enhancement of company-led human resource development in this way, the Planning Bureau of the Economic Planning Agency issued a proposal in June 1987 entitled "Human resource development in a period of occupational structure reform – prescription in the structural unemployment age" that highlighted the importance of individual-led human resource development. This was a report by the Research Study Group on Occupations for Life and a Lifelong Learning Society in 2000 chaired by Akira Takanashi (former Chairman of the Japan Institute of Labour). It stated, "The future labor market will progress toward two mobilizations; one will involve labor turnover among companies or industries, and the other will involve labor turnover among occupations accompanied by improvements in occupational capability (Keizai Kikaku Cho 1987, 112–113)." However, rather than promoting conversion from company-led to individual-led development, it highlighted the need to combine these two approaches. The report also stated that in order for individual-led human resource development to function in practice, it was important to build "a system in which laborers raising the quality of their work through education/training are justly evaluated, and do not suffer a disadvantage in corporate adoption or treatment"(Keizai Kikaku Cho 1987, 115) – that is, it promoted a highly reliable occupational capability evaluation system.

In this way, the growth of the concept of occupational capability evaluation for individuals can be traced back to the period of the revision to the Human Resources Development Promotion Law as outlined above.

The Rise of Another Background Factor: The Concept of Lifelong Learning

Akira Takanashi attended the Part II Sectional Meeting of the National Council on Educational Reform as a special committee member in the period when the above report was issued. In the first reply report, he initially placed the study of subjects not as lifelong education but as lifelong learning. In the second reply, he placed strong emphasis on the creation of a reform proposal for a shift toward a lifelong learning society (Takanashi 1987, 52-56). The following is an examination of matters and views regarding human resource development and occupational capability evaluation concerning the lifelong learning proposed in the reply of the National Council on Educational Reform. Section 2 (Synthetic promotion of lifelong human resource development) of Chapter 5 (Activation of social education), with which Takanashi was deeply concerned in the second reply (April 1986), proposed advancement toward maintenance of education/training organization inside and outside companies, improvement of self-education motivation, diffusion of in-company skill test systems, improvement of various other occupational qualification systems and skill test systems, and the planning of a substantial occupational capability evaluation system to synthetically promote human resource development through ongoing occupational lifelong learning. In the third reply (April 1987), Section 1 (Pluralization of evaluation) of Chapter 1 (Shift to a lifelong learning system) proposed a thorough review of public

occupational qualification systems from the viewpoint of making occupational qualifications a true backing of capability while attaining pluralization of evaluation and reforming the state of academic career-oriented assessment as a fundamental direction for evaluation. Today, the concept of a shift to lifelong learning as a main pillar in the reply of the National Council on Educational Reform and the promotion of individual-led human resource development proposed in the report ("Human resource development in the period of occupational structure reform") have become established, and Takanashi is involved in the promotion of both.

The advancement of occupational structure in the 80s made human resource development for white-collar workers a major consideration in the promotion of lifelong personnel development. The Lifelong Human Resource Development Study Group, which would examine the direction of future human resource development in October 1985, was established during this period with Takanashi as its chairman. The group put together a report entitled "Systematic promotion of lifelong human resource development toward the 21st century" in June 1986. It proposed the tackling of subjects that would enrich education/training outside companies, collaboration for education/training within companies and elsewhere, and expansion of the occupational capability evaluation system for white-collar workers and employees of small and medium-sized businesses. Takanashi said that the report's content was in line with the concept of lifelong learning raised in the National Council on Educational Reform's second reply (Takanashi 1987, 186–187). The report became a starting point and led to the establishment of six investigative committees based on six subjects (including education/training for white-collar workers and a qualification system for industrial workers) in fiscal 1988. The Investigative Committee on a Lifelong Human Resource Development System for Industrial Workers (with Takanashi as its chairman) put together a report in July 1992. It proposed a scheme for a occupational capability acquisition system (a.k.a. the Business Career System) that promoted the two measures of individual-led human resource development and a new occupational capability evaluation setup under a single system. A revision of the Human Resources Development Promotion Law was announced in June of the same year with timing that seemed to be in preparation for the realization of the scheme. Under this revision, it became possible to carry out vocational training centered on knowledge acquisition for white-collar workers and other staff at organizations other than public training institutions.

In this way, Takanashi, who was a committee member of the National Council on Educational Reform, played an important role in developing the occupational capability evaluation system that made lifelong learning a common concept through examination of the above process from the early 80s to the early 90s.

The Rise of Individual-led Development after the Collapse of the Bubble

In regard to industrial circles, the Japan Federation of Employers' Associations released a report called "Japanese Management in the New Age" in May 1995, and management expressed an interest in asking workers to take responsibility for individual human resource development for the first time. This expression can be viewed as the seed for the conversion that brought about the background change in economic ambience after Japan's bubble collapsed (unlike the logic of "Human resource development in the period of occupational structure reform"), and indicated the importance of individual-led human resource development. The eighth Employment Measures Master Plan passed by a Cabinet decision in December 1995 promoted individual-led human resource development as an employment policy, as if in prompt response to the above expression. To promote the policy, the plan stated, "It is necessary to devise measures for objective evaluation of occupational capability throughout the whole of society." It was intended to bring about greater fullness and promote practical use of the Business Career System, the public skill test system and other facilities. The sixth Human Resources Development Master Plan approved in February 1996 in response to the eighth Employment Measures Master Plan promoted individual-led human resource development and outlined a number of basic measures: promotion of private-sector occupational capability evaluation, establishment of a skill test authorization system, proliferation of in-company skill test systems and dissemination and practical use of the Business Career System. In fact, the promotion of the Business Career System progressed as shown in Table 3. A special characteristic of this system is its linkage with actual VET and occupational capability evaluation. Its proliferation can be said to have invigorated conventional VET, which had previously lacked linkage with occupational capability evaluation.

Table 3

Progress of the Business Career System

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number of course completion examination entrants	5,064	5,732	7,790	11,271	13,671	16,363	19,766	21,887	23,315
Number of such entrants passing the examination	1,284	1,768	3,116	4,102	5,063	7,922	10,240	12,086	13,387

The Human Resources Development Promotion Law was revised in April 2001, and the introduction of descriptions (referred to as *kommentar*) of the legal revision by the Ministry of Health, Labour and Welfare brought the term "career formation" into the mainstream. The expression makes clear the intention of placing workers in the role of individual subjects as the focus of a policy. This introduction was a manifestation of further devotion to individual-led human resource development as described here:

"With the old human resource development policy, the political viewpoint of paying attention to individual career formation as a whole was comparatively thin. At the center of the policy were the provision of support for human resource development mainly carried out by companies, public occupational guidance for the unemployed and employees of small businesses, public education/training services and other initiatives. However, supporting the career formation of individual workers is becoming increasingly more important politically with changes in the situations surrounding employees."(Kosei Rodo Sho 2002, 16–17)

Although individual-led human resource development was positioned for implementation in collaboration with in-company human resource development, the importance of the former was increased and clarified as a result of further drastic changes in employment environments after the sixth Human Resources Development Master Plan was introduced in 1996. The above-mentioned description resulted in feelings of limitation because even if workers tried to promote individual-led career formation in companies, there were significant challenges in the circumstances of a collective and uniform labor system with clear employment dependency rules.

The measure relating to occupational capability evaluation targeted maintenance of an occupational capability evaluation system by which workers could be properly assessed as a base for effective functioning of the labor market with devotion of the policy to such individual subjects. In fact, the range of private sector testing institutions that could engage in business relating to skill tests and the range of business these institutions were allowed to engage in were expanded to support the maintenance of the occupational capability evaluation system introduced by the legal revision of 2001.

In this way, the rise of the individual-led approach in human resource development policy undoubtedly increased the importance of occupational capability evaluation for individual subjects. As a result, the following systems based on such evaluation were introduced in the 2000s:

2002: Shokugyo noryoku hyoka kijun (Occupational capability evaluation standards)

2004: YES program (Youth employment basic capability support undertaking)

2008: Job Card System

2010: Career Dani system (based on a Cabinet decision)

Conclusion and Recommendation

The above examination reveals how the benefit of measures relating to occupational capability evaluation shifted from skill buyers to skill sellers with a turning point in the 80s, and that there was no change to place more emphasis on industrial development in the process of the new Vocational Training Law's enactment. It can be said that there was no change in the structure that fundamentally benefited skill buyers in the 70s – a structure that promoted lifelong training based on the new Vocational Training Law. The beginnings of the concept of occupational capability evaluation for individual subjects

are seen in the mid-80s period of revision to the Human Resources Development Promotion Law. The National Council on Educational Reform was also established during the same period, and committee member Akira Takanashi had a significant influence on the formation of an occupational capability evaluation system that made the concept of lifelong learning an accepted idea. After the mid-90s, occupational capability evaluation of individual subjects in consideration of individual-led human resource development was promoted as a basic measure. Based on these outcomes, the question of whether this shift in the outlook of labor administration resulted in a change in the method of evaluation can be examined. This is a subject for future studies.

Based on the result of this study, the followings can be mentioned as recommendations in a theoretical aspect to the policy making authorities and the private evaluation organizations in Japan.

The Japan's feature of occupational capability evaluation which R. Dore & M. Sako pointed out already becomes the past thing and must be corrected because it is changing to the British model. That is;

- (1) Authorization body for occupational capability evaluation has shifted to the private sector from the government.
- (2) Occupational capability evaluation has come to be interlocked with education and training like an evaluation system of the Job Card System or the Business Career System. (Formerly, occupational capability evaluation was not necessarily being interlocked with education and training.)
- (3) Occupational capability evaluation has come to measure practical occupational capability. (The conventional skill tests were not necessarily measurement of practical occupational capability because of restrictions of an evaluation method.)

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A Case Study of the Funeral Mortician Services on Transition Effects for Adult Vocational Training Program in Taiwan

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ABSTRACT The purpose of this study was to explore and assessed the transition effects of the vocational training for the adult learning programs on the funeral mortician services (FMS) in Taiwan. This vocational training program for the funeral undertaker in service courses were held by the Bureau of employment and vocational training (BEVT) at council of labor affairs (CLA) in Taiwan. These objectives of the study were investigated by the interrelationship among four aspects: (1) the efficiency of the training transition, (2) training course design, (3) workforces support, and (4) adult learning motivation. The research design of the survey investigation through questionnaires and the open-oriented questions were the research method. The study randomly selected 540 participants from the adult learners who took the funeral service courses held by the BEVT at CLA in Taiwan. The instrument used involved self-design, the adult vocational training transformation rubric, which included five parts, such as the personal information, the efficiency of the training transition, training courses design, workforce support, and adult learning motivation. The questionnaires of survey in processing of the statistical techniques to analyze the data included t-test, one-way ANOVA, Scheffe,s posterior comparisons, person's correlation analysis, and stepwise multiple regression analysis. The research results were as the following: (1) The vocational training program results and the training transition effects were positively related to trainee for adult learning characteristics. (2) The vocational training program results and the training transition effects were positively related to trainee for adult learning education background. (3) In combining organization goals and trainee for adult training career plan that had helped the trainees with the training transition efficiency. (4) The training transition efficiency promotions were positively related to organization restructures positive learning ambiances. (5) The training transition efficiency was positively related to the training course contents in satisfaction. (6) The training transition efficiency was positively related to the workforce support. (7) The adult learning motivation was caused by the stress of the real life and the employment situation. Also the learning motivation was affected by the personal interaction with the living environment. Finally, the results would be provided to the related training centers, industries and the funeral

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mortician services companies, government agency, and the Bureau of employment and vocational training (BEVT), council of labor affairs (CLA) to improve the training transition efficiency. Furthermore, it would be promoted to the future researches.

KEY WORDS adult learning, funeral mortician service, training transition efficiency

Introduction

As the 21st century comes, the public and private organizations have realized that the human resources departments play important roles of strategies and policies tendency including the executive positions would think highly of it. There are more and more businesses expecting for the training through internal development or governments' resources to promote the growth of the employment. By improving the organization's overall performance, it makes the development of human resources, benefits and status. For the enterprises, the implementation of vocational education and training hope enhance the staff's knowledge, incentive motivation, and then contribute to the job satisfaction.

Since 2008, the world has experienced an economic tsunami threat in impacting the world economy. As a result, the countries around the world try to stimulate the markets by pulling out the solutions and programs such as subsidizing the coupons and training courses, short-term employment promotion programs and so on. To increase the employment opportunities in the most effective and directive ways is to create the employment opportunities in a knowledge society and lifelong learning concepts, let the manpower become the prepared workers, and improve the labors' employment competitiveness. The functions of the vocational education are to make the employment preparation, work to maintain, strengthen the employment promotion, reemployment and even make the functions of preventing unemployment.

The governments not only increase the expansion of domestic demands and improve people's employment opportunities, but also set up the public vocational training institutions. The institutions providing vocational training play the important parts including how to use more effective approaches to train, to improve the trainees' professional skills and knowledge, to take into account the personal, corporate and national society needs, to gain the efficiency of their training, and then to smoothly expand the employment or career development of the ultimate goal. In this view, the BEVT hope the application of training promotion will be the continuous improvement in deepening the level of technical expertise and increasing their productivity.

Research Background

Learning Needs of Adults

As the social and economic patterns going and the career planning changed by the concept, human life was in need for the diverse career planning which can face the rapidly changing social patterns of development. Dr. Norse, American commitment of adult educators, said: the adults who want to maintain the standard and effectiveness of their work, they had to accept the re-education or training for three to five times. Thus, in response to the needs of the adult learning after the traditional education, it was necessary to continue their lifelong educational process.

Experience of Self-Growth

The researchers grown up in the funeral service family, from the grandfather, father, relatives and friends were all engaged in the funeral-related industries. They had witnessed the funeral industry business from the traditional style to the current integration of the professional mortician company type. Not only did they mourn the vanish of the unique cooperation society culture, but also felt that it should be the time to reform the funeral culture quality and make the annotation again to the funeral service industry.

The Lack of the Training Transfer Effective Assessment of the Funeral Vocational Training

At present, most of the training transfer of effectiveness assessment was only for the insurance industry, corporate organizational factors, personal motivation level and training transfer relationship. For the persons who were on-job of funeral services, vocational training transition efficiency of the researches was nearly few.

Tie-in the National Economic Planning and Policy Development

In response to the country's overall economic development planning needs and from the funeral ceremony services in the view of work content allows the funeral business to improve the service attitude, such as their own caring work attitude and spirits. The service of humane care industry and the ultimate mental development were critical in the neighbor countries to follow. There were not much huge natural resources in Taiwan where much relied on the development of export economic trade and service industries upgrading. Therefore, it was much worthy to research the transfer effectiveness of vocation training in funeral services.

The Purpose of Research

1. To research the difference of the workforce support cases about the background variables of student motivation in the learning process, curriculum teaching satisfaction.
2. To research the differences of transfer cases about the background variables of participants in the training effectiveness.
3. To research the relevant circumstances about the degree of learning motivation satisfaction, career support and training level of transfer effectiveness.
4. To research the degree of motivation of students, teaching satisfaction, workplace supports the level of training among the effectiveness of the transfer of predictive power.

Research Subjects

The Study Participants

The labor vocational training council of the Executive Yuan council, abbreviated as VTC, submitted the missions such as "subsidies for local government training" and "occupation voucher" projects for the vocational training unit in charge such as the contractor unit, the Executive Yuan council of labor vocational training council-owned vocational training centers, county and city governments and county mortician institute, office of management "funeral attendant training. Therefore, the study participants and the research samples were the students of the units above.

The Research Period

The researching period was from January to December, the whole year in 2008 when the funeral attendant classes of the subsidies for the local government training and the occupation voucher project at the same time.

Method

Sampling of Population

Executive Yuan council of labor affairs of the VTC as commissioned "subsidies for local government training" and "occupation voucher" project of education and training institutions project education and training institutions. Undertaker had five district and training centre (Executive Yuan council of labor vocational training council-owned northern, central, southern, Taiyuan, Tainan vocational training centre), ninety-seven year run funeral attendant class total of 21 flights (ministry of the interior secretary for home affairs, 2008), the total number of 630 trainees, the training of qualified and then employment a total of 540 participants in this study as trainees for the study population.

The labor affairs of the executive Yuan commissioned the VTC as the project of education and training institutions for education and training project and as the subsidies for the local government training and occupation voucher. There were five main area training center such as the northern, central, southern, Taiyuan, Tainan vocational training center. The labor affairs sponsored the five area training center in 2008 they opened the funeral attendant classes for 21 classes in total. There were 630 training students including 540 qualified training members. In this study, the researcher used the trainees as the study population. In asking for the help from the local employment of the service stations, institutions and training units, the researcher removed the data which were short of the detail information or the ones who could not be reached and then conducted the survey of the sample population. There were a pre-test questionnaire and an official questionnaire. In the pre-test, there were 90 questionnaires sent to the pre-testers; as a result, there were 77 replied questionnaires and the effective rate was 85.56%. Meanwhile, in the official questionnaires, there were 450 questionnaires; as a result, there were 352 replied questionnaires including 22 invalid questionnaires, 330 valid questionnaires and the effective rate was 78.2 percent.

Research Tool and Instrumentation

Designed by the researcher himself, the study, formally survey the "adult participation in the vocational training council of labor affairs vocational training transition efficiency questionnaire" as the study tool. The questionnaire contents included five parts such as basic information, degree of motivation, teaching, career support and transfer of training effectiveness. The construction process of the research tools was divided into data collection, the questionnaire script, pre-test questionnaire, the implementation and the official questionnaire.

Content of Research and Procedure

The Self-designed Rubric

This research study aimed to review documents and the contents of the questionnaire which was divided into five parts, namely, basic data, variable degree of motivation, curriculum, teaching variables, workplace support variables and the effectiveness of training transfer.

Expert Content Validity

This study adopted the expert content validity. According to the literature data collected, the adult participation in the transfer of the effectiveness of vocational training expert validity survey questionnaire "was made by the researcher himself. The researcher also invited seven domestic professional experts and scholars who were with practical and promotion experiences in the funeral mortician service industry. The questionnaire contents were stated by the relevance accuracy and the necessity after added, deleted, merged and polished from the proper diction or other recommendations.

After the expert validity data were collected, the researcher modified and preceded the statistical analysis according to the experts' advices and information, and then used the frequency distribution and percentage to conduct the statistical analysis.

The researcher removed the applicable options which were under 75% available but retain the ones above 75% available. After that, there were reserved over 85% in sum of the percentage of the applicable option and the modified-application option. The researcher discussed with the advisor for many times and the questionnaire was revised and identified specifically as the pre-test questionnaire which was eventually reviewed by the advisor.

Statistical Method and Data Analysis

Pilot Analysis-The Assessment of the Missing Value

From the frequency distribution table, it was found that the missing values were all under 3 in each question and it showed that the whole questionnaire wasn't hard to answer for the testers. The items analysis of the pre-test questionnaire made the standard of the selected-question from critical ratio which was abbreviated as CR and the same as t-Value. The larger t-value it was and the more difference there was between the group-high and the group-low; therefore, it meant that the higher degree of the test it was as well.

The calculation formula for the validity questionnaire was to select the highest scores of 27% for the group-high, the lowest scores of 27% for the group-low, and then the scores of the two groups for each question were analyzed by the t-test. The degree of the test was decided by CR, the t-value of the t-test. The CR had to be up to the significant level of 0.1 and the CR of the absolute value was 3.0 or more for the filter of the elected-questions. The correlation coefficient between the selected-question and the total scores of the questionnaire had to be up to the significant level of .01 and the absolute value was up to .3 or more. The analysis found that the absolute value of CR was less than 3.0 to 1.159 from question 1 to question 6 and their absolute values of the correlation coefficient of .154 was less than 30 in the motivation degree rubric. Questions 1 to question 6 were all deleted according to the filter standard. In the curriculum teaching rubric, the absolute value of question 3-1, question 3-16 and question 3-19 were less than 3.0 and their absolute values were .113, .332, 287 which were less than .30; therefore the questions above were all deleted according to the filter standard. Based on the above analysis, there were 67 questions for the original questionnaire, but were deleted the ones which didn't meet the filter standard and then 62 questions were retained to met with filter standard of the selected question.

Factors Analysis

The deleted questions in accordance with the item analysis of the questionnaire, was analyzed by the factor analysis according to the different dimensions. According to Scholar Kaiser (1974) pointed out, if the KMO was less than 0.5, it was not suitable to

conduct the factor analysis (cited in Ming-Lung, 2006). However, according to the analysis of the results, after the questions filtered above, its KMO value of the rubric was suitable for the factor analysis to be conducted. The proceeding analysis steps were as the following.

- (1) To analyze the exploratory factor analysis in the remaining questions in a questionnaire conducted
- (2) Adopting the common factors extracted from the main component analysis
- (3) Using the principle component factor analysis to extract the common component
- (4) Using the factor principle which the Eigen value was greater than 1 and came with the variance to decide the numbers of the factor.
- (5) To varmax the factor varmax for the largest variation via the law of vertical varmax
- (6) Selecting the factor loaders under .4 as the extractive factors based on the extraction factors.
- (7) To establish the sub-rubric of the construct validity by extracting a common factor.

Following the research procedure above, if there were only one or two questions of the undead common factors, the question would be deleted. Question 3-8 and question 4-2 were both deleted and there were 60 questions in sum in the official questionnaire.

Reliability and Validity

Reliability Analysis

According to the results of the reliability analysis of the factor analysis for the entire rubric in the study, it showed that the Cronbach α values were .8975, .8776, .9276 and .9484 for the respective rubric of the learning motivation, curriculum design contents, workplace support level, and training transition efficiency. Furthermore, the alpha coefficient after-deleted for each item, the Cronbach α value was .9733 of the whole rubric and it showed there was internal consistency in the entire questionnaire as the table 1

Table 1
The Summary Reliability Analysis

Rubrics	Motivation to learn	Curriculum	Workplace Support	Effectiveness of Training Transfer	Total Performance
Cronbach α	.8975	.8776	.9276	.9484	.9733
Numbers of Question	15	13	19	20	67

Validity Analysis

The validity was utilized by the content validity and construct validity to test. When the rough draft of the questionnaire was edited, it had been revised by many scholars and experts and 90 adult learners in the questionnaire to response for the factor burden and explained variance in order to build the appropriate construct validity.

Results and Discussions

Basic Data Analysis

The basic data background in the 330 trainees of the test subjects were as the following.

- (1) There were more female students than male students.
- (2) The ages of them were from 31 to 40 years old.
- (3) Most of their academic backgrounds were the high schools or vocational high schools or bachelor.
- (4) The majority of their economic responsibilities were by themselves.
- (5) Most of them were unemployed before they attended the training courses and there were 50% of them employed from two to three months after completing the training courses.
- (6) There were 49.4% of the students afford the training fees by themselves.

There is the information of compiled chart of hypothesis on verifying results as the following of table 2.

Table 2

The Information of Compiled Chart of Hypothesis on Verifying Results

Item	Results of Hypothesis	R	A
Gender	Significant differences for the different gender in the degree of motivation	√	
	Significant differences for the different gender in the satisfaction of curriculum teaching	√	
	Significant differences for the different gender in the degree of workplace support	√	
Age	Significant differences for the different age in the degree of motivation	√	
	Significant differences for the different age in the satisfaction of curriculum teaching	√	
	Significant differences for the different age in the degree of workplace support	√	

Education	Significant differences for the different education in the degree of motivation	√
	Significant differences for the different education in the satisfaction of curriculum teaching	√
	Significant differences for the different education in the degree of workplace support	√
Marriage	Significant differences for the different gender in the degree of motivation	√
	Significant differences for the different marriage situation in the satisfaction of curriculum teaching	√
	Significant differences for the different marriage situation in the degree of workplace support	√
Economic Burden	Significant differences for the different economic burden in the degree of motivation	√
	Significant differences for the different economic burden in the satisfaction of curriculum teaching	√
	Significant differences for the different economic burden in the degree of workplace support	√
Employment Situation	Significant differences for the different employment Situation in the degree of motivation	√
	Significant differences for the different employment Situation in the satisfaction of curriculum teaching	√
	Significant differences for the different employment Situation in the degree of workplace support	√
Employment after Training	Significant differences for the different employment situation after training in the degree of motivation	√
	Significant differences for the different employment situation after training in the satisfaction of curriculum teaching	√
	Significant differences for the different employment situation after training in the degree of workplace support	√
Sharing ratio for Training Fee	Significant differences for the different the sharing ratio for training fee in the degree of motivation	√
	Significant differences for the different the sharing ratio for training fee in the satisfaction of curriculum teaching	√
	Significant differences for the different the sharing ratio for training fee in the degree of workplace support	√

Footnote, R for Rejected & A for Accepted

Conclusions and Recommendations

Conclusions

The Degree of Learning Motivation will Affect the Results of Training and Transfer Effects

In the aspect of the population background, the young students showed that there was much related influence on learning and they showed the higher transfer degree of the training effectiveness than the older ones. The study found that the younger students knew nothing about the funeral service content, but their absorptive ability and learning motivation were higher than those of the older ones. It showed that the younger ones were progressive on the learning degree as well. Meanwhile, the information age made the funeral information was easier to get for the younger students. Understanding how to browse the latest information on the Internet and interact with the others by discussing, the younger students could get the better training results than the older ones. It could be seen that, there was significantly related to the characters of the participants and the effectiveness of training. According to the finding, it was important for the companies or organizations in recruiting qualified personnel and found the suitable candidates for human resources development organization of the company.

Learning Motivation Came from the Life and Job Stress, and was the Product of the Interaction of Personality and Environment

Based on the data analysis by the trainees who were unemployed or employed before the training, the variables, such as the degree of learning motivation, teaching satisfaction and perceived level of workplace support, got the significant level; while the other result of the variables were below the level of significance. It could be seen that the participants for the sake of the future having a job opportunity, they were all eager to learn than the on-job students. As long as they would have any opportunity to fight for the jobs, they would catch any chance for themselves. Therefore, it didn't matter whether there was job in the market or not, it meant something on the seeking job of learning motivation which could be cultivated and intensified for the life-long learning.

The Higher Education Level and the Higher Training Transition Efficiency

In the aspect of the trainees' educational degree, the bachelors and masters were for 12 % and the level of the training transition efficiency for the masters were higher than the bachelors, and even much higher than the ones who accepted the lower educational degree. It meant that the ones with higher educational degree were more likely to accept the new funeral concepts of change and to plan the service complying with the needs of environmental protection and the funeral service with dignity.

Combined with Organizational Goals and Students' Career Planning Helped the Students Improve the Training Transition Efficiency

If the students clearly had clearer plans, they would enhance their learning attitude during training and career planning. Therefore, the clearer career planning and the more useful upgrading in helping the training transition efficiencies what they had learned in the workplace.

The Training Transfer Enhanced the Active Learning Effectiveness for the Organizations to Create the Positive-oriented Atmosphere

There were significant correlation and positively correlated among the trainees to the level of the working environment (organizational climate, peer support, supervisor support) and the effectiveness of the training to the level of transfer (application situation, interaction, professional growth). It could be seen that if the workplace environment including the company's operations and staff interactive atmosphere, I t was able to create a good learning environment which they could effectively promote learning.

Teaching Satisfaction Could Significantly Predict the Effectiveness of Training Transfer

On the effectiveness of the predictors with the satisfaction in teaching students of all levels and the overall transfer of training variables were with the different criterion variables and had different predictive power. The teaching satisfaction of which the "curriculum planning, content dimension and the training transition efficiency on training application scenarios, interaction, and professional development were the main three dimensions of predictive power. The higher of the training courses and future work and the more possible for the training transition efficiency. The adult learning was no longer done as the pre-scheduled, but re-built their own thinking models on the funeral service quality and value which were clarified for the entire management throughout self-reflections. Under the curriculum and the professors' instructed that matched with the gradual and practical work experience in the qualification phase, the students would cultivate the professional knowledge, seek the continuous improvement and better performance, and then the transfer of training would effectively enhance the effectiveness naturally.

The Workplace Support Could Significantly Predict the Awareness of Training Transition Efficiency

With the different criterion variables to predict the effectiveness of the role of migration, there were different predictive powers because of the student s' support in the workplace and the degrees of awareness in different levels of training variables. The support level of awareness in the workplace, such as the organizational atmosphere dimension and the peer support dimension, there were two main predictive powers for

the training transition efficiency on the training application scenarios dimension and professional development dimension. Students could implement their own or work with peers to share experiences or training from the real examples and then got the faster growth. To become experts in the professional areas or to enhance the quality of work status, the positive organizational atmosphere and environment could enhance the peer interaction. It also could enforce the better learning and might start the experiences in providing the exchanging platform for professional growth. The trainees in the workplace had the opportunity to verify their training by learning and got the attention; therefore the future professional growth could be expected.

Recommendations

In the Aspect for the Units of Labor Director

- (1) To cultivate the seeds of funeral mortician service instructors and to provide the related test for the professional training courses.
- (2) To combined with the resources of the related industries, governments and schools to improve the additional values of the training transition efficiency.
- (3) To services for the future industry, government guidance should help companies own arrangement education and training. The government should help the funeral mortician service companies or consultant centers to hold the self-conducting education and training while the services of the industry met with the future in transition effect needs.

In the Aspect for the Training Center

- (1) To provide the trainees with the Taiwan training qualifications system (TTQS)
- (2) To establish the teaching manpower information database, and to provide more diversified teaching strategies.

In the Aspect for Institutions

- (1) The companies should create an interactive atmosphere for the peer relationship, develop and the lifelong learning concepts mapping
- (2) To plan the personnel training programs, and strengthen the competitiveness of the management teams.
- (3) To use the advantages of the network information and enhance the effectiveness of educational effectiveness and training.
- (4) To strengthen the top-down plans for the educational training and pay attention to the bottom-up learning needs.
- (5) To seek the cooperation alliance and create the new blue ocean for the funeral mmortician service industry.

In the Aspect for the Future Research Recommendations

(1) Recommendations for the research time

This study was constrained for the research period especially for the horizontal transfer time measurement for the training effectiveness. If the study could focus the time tracking on the longitudinal study, it would be able to have more strict interpretation for the degree of motivation, workplace support level and transfer training effectiveness.

(2) Recommendations for the research objects

The definition and the degree of the training transition efficiency were related to the judgments of the supervisor and the peers in the workplace. Besides, under the evaluation model with the self-evaluation and peer evaluation, it's easier to fully understand the students' training transition efficiency. For the future researchers, scholars and whom might concern, it was proposed that the students' supervisors and the colleagues as the participants of the survey subjects. The researchers could the clearer understanding of students' receiving post-training attitude in the work performance, professional skills enhancement and continuous improvement in the funeral professional knowledge in order to confirm the transfer of training effectiveness.

(3) Recommendations on the study variables

This study mainly investigated the differences among the pre-training employment status, unemployment and employment, in the training transition efficiency. The results showed that the unemployment students' the training transition efficiency was much higher than the employed ones and that was different from the traditional concept. Furthermore, there were less relevant research literatures it's worth the further studies to explore.

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A Study on Web-Based Micro-Entrepreneur Competency Analysis: Using the Retail – 3C Marketing in Taiwan as an Example–

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ABSTRACT The main objective of this study is to analyze entrepreneurial competency required by web-based micro-entrepreneurs in the retail – computers, communications and consumer electronics industry and to develop a competency catalogue for this specific domain accordingly. To develop such a competency catalogue, the investigators conducted a literature review, an in-depth interview and Delphi-based questionnaire surveys. According to the obtained data, eight major aspects and a hundred and nine competency indicators were developed and can be used by universities, colleges or other education institutes for constructing their courses on web-based entrepreneurship to help web-based micro-entrepreneurs develop the required entrepreneurial competency.

KEY WORDS web-based entrepreneurship, micro-enterprises,
competency analysis, competency catalogue,
education and training

Research Background, Motivation, and Objectives

The market value of Google in 2012 has reached as much as 130.9 billion USD, which exceeds the total market value of Amazon, eBay and Yahoo, the three major business paradigms for web-based transactions, e-business, internet auction, as well as web portals. This victory of Google marked an important cornerstone in web development (Epochtimes, 2012), and the fast rising of Google has become a teaching model par excellence for the attempt of replacing brick-and-mortar enterprises by web-based ones (Lee, 2006). In other words, e-commerce is now strategically critical for global market expansion (Kao, 2010a). According to the survey result of E-commerce

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Development Plan for the New Internet Era conducted by the Department of Commerce of Ministry of Economic Affairs, there has been a steady increase in e-business over the past three years, both in terms of business to consumer (b2c) and consumer to consumer (c2c). In 2009, the market scale of domestic b2c e-business reached 207.6 billion NTD. As for c2c, the e-business market scale was 142.7 billion NTD. These two added up to a market worth 350.3 billion NTD, which is about 113 billion USD (Weng, 2010).

Internet technology advancement as well as an increased popularity of online consumption has pushed the booming of web-based entrepreneurship. Studies have shown that the effect of web-based entrepreneurship is affected by network application technologies as well as the operating, planning and managerial capacity of managers (Lu, 2005). In Taiwan, though e-business development has indeed brought a significant surge in consumption in various areas and created more business and job opportunities, one should be aware of the various potential risks and bottlenecks that may be confronted in e-business development. It can be found from the profitability of online retailers that the outcome of running online retail shops is not optimal—about 50.3% of online retailers have failed to reach the annual breakeven point, and while 22.3% of online retailers have reached the annual breakeven point, only 27.4% of online retailers can be considered as truly profitable (Kao, 2010b).

According to the above information, information technology development and the pluralistic and convenient nature of online shopping have caused conventional in-store shopping to be gradually replaced by online shopping, and this transition is supported by an increase in online transaction capital. In addition, there has been an ongoing expansion of e-business and the capital has increased as well. Nonetheless, available data suggest that only a quarter of these online retailers are really making money; the remaining ones are either breakeven only or losing money. To cultivate successful e-business talents for the country, it is therefore critical to carry out a systematic vocational competency analysis to gain insight into professional competency required by online sellers.

For the purpose of education and training, a famous quote of Babson College, a school founded on entrepreneurship, is that entrepreneurship can be taught. Babson College has been judged by US News and World Report as the best business school in the US for 15 years consecutively. In 1966, Babson College offered the very first entrepreneurship course, and then in 1978, the school established the first academic research center focused on entrepreneurship. In 1981, the school held the first entrepreneurship symposium, making entrepreneurial issues much more valued than before (Hsieh, 2008). According to Jarillo (1989) and Gumpert (1982), entrepreneurship is one of the most interested business domains for research in the US since 1978. American President Ronald Reagan once commented that the US had gone through an era with flourishing large-scale industries and another era marked by giant conglomerates, but he believed that the era of entrepreneurs had now begun. Bhide (2002) pointed out that some phenomena making entrepreneurship unique are the many praises about it, the countless studies investigating it, the many people formally

joining it, a large number of students studying it, as well as the many company managers switching their career path for it.

More recently, Taiwan has started cultivating high quality entrepreneurs through various innovative and entrepreneurship-oriented competitions in hope to increase the public's awareness on entrepreneurship education (Chou, 2005). The aim here is to provide people with entrepreneurial experience from participating in these innovative entrepreneurship competitions as well as relevant competency training. This is an excellent strategy for countering poverty and promoting economic growth because entrepreneurial experience can improve one's competitiveness in the job market (Chi, 2010). A survey conducted by Sun Yat-sen Management Education Foundation in 2005 among youth and students who had participated in entrepreneurship competitions over the past three years suggested that only nine participants were actually involved in entrepreneurship at that time, while 59% of participants considered themselves not ready for it and needed more experience. Furthermore, while about 39% of participants considered that the major entrepreneurship obstacle lies in the lack of relevant expertise, 25% of participants regarded short of funding as the main hindrance. Taken together, there is much room for improvement in entrepreneurship education, and key factors preventing participants' from starting their own business are a feeling of lack of preparation, insufficient expertise, and short of funding (Sun Yat-sen Management Education Foundation, 2005). Furthermore, the Global Entrepreneurship Monitor (GEM) revealed that the Total Entrepreneurial Activity Index (TEA Index) for Taiwan in 2010 was 4.3, that is, for every one hundred people in Taiwan, less than five people are starting their own business or running a new business that has been established for less than 42 months. In contrast, the index for India, South Korea, and mainland China was 17.9, 14.5 and 12.3 respectively (Huang, Yang and Liu, 2010), which were all greater than that of Taiwan.

Taken together, it is important to put more effort into elevating entrepreneurship education in Taiwan. Countries worldwide have already treated entrepreneurship education as a means for improving the competitiveness of their youth. Besides from the entrepreneurship-oriented Babson College that provides comprehensive and systemic entrepreneurship curriculum (Hsieh, 2008), there are also a national entrepreneurship education alliance established in the US and the National Content Standards for Entrepreneurship Education launched for providing organizations with references for planning their entrepreneurship curriculum (Consortium for Entrepreneurship Education, 2004). In Taiwan, entrepreneurship education is still at the sprouting stage. To elevate and strengthen the competitiveness of prospective employees in the job market, we have to speed up entrepreneurship education and prioritize it as the primary task of education at the current stage.

Among Asian countries, Taiwan not only is technologically advanced in computers, communications and consumer electronics products but also possesses the highest usage rate, penetration rate, and user acceptance rate. As a result, any trend or change happening in the market of computers, communications and consumer electronics products in Taiwan is treated as a vital indicator by big multinational technological brands. The rapid change in computers, communications and consumer electronics products has significant

antly altered Taiwanese consumers' consumption patterns and concepts on computers, communication and consumer electronics products. Meanwhile, major changes have also been observed in consumer interaction and distribution channels for computers, communication and consumer electronics products (marketing.chinatimes.com., 2010).

Kaplan and Warren (2007) pointed out that the number of small-scale and micro-scale entrepreneurs has multiplied greatly, and this phenomenon indicates that a new economic era featuring distinctive economic forms and thinking patterns has begun. The employment-oriented philosophy emphasized in the industrial era is now outdated and should be replaced by innovative entrepreneurship. Moreover, the attempt of using promotion of internal entrepreneurial activities to boost a company's market competitiveness should be redirected to encouraging independent entrepreneurial actions. The rise of knowledge economy and the rapid information dissemination have created an economic environment optimal for micro- and small-scale business ventures because the greater uniqueness and innovation of micro- and small-scale enterprises are useful for surviving in such an information volatile and globalization dominated world.

Taken together, while online shopping, i.e., e-business, has become the dominant trend of development, Taiwan should work further on entrepreneurship education and training as well as improve entrepreneurial competency of people interested in starting up their own companies. Because the computers, communications and consumer electronics industry, covering both manufacturing and distribution, is a strong and much emphasized industry in Taiwan, the investigators of this study chose this industry as the subject of this study.

According to the background and motivation presented above, the two objectives of this study are as follows:

- To analyze entrepreneurial marketing competency required by micro-entrepreneurs in the retail – computers, communications and consumer electronics industry.
- To develop a competency catalogue for micro-entrepreneurs in the computers, communications and consumer electronics industry.

Literature Review

Definition of Web-based Micro-Enterprises

To define micro-enterprises, Hsieh (2005) reviewed definitions used by different areas. For Organization for Economic Co-operation and Development (OECD), micro-enterprises are business organizations with less than 20 employees. According to Department of Housing and Urban Development (HUD), micro-enterprises are those with less than five people (including the proprietor). In France, *très petite entreprises* (very small enterprises) are defined as companies hiring less than nine employees. The European Commission, on the other hand, termed companies with employees between one and nine as micro-enterprises. In Japan, companies from the manufacturing sector

with less than twenty people and companies from the commercial service sector with less than five people are both referred to as *reisaikigyō*, i.e., micro-enterprises.

Taiwan has not yet defined the term micro-enterprise, but the idea can be found from the application procedure for micro-entrepreneurship loan with the Council of Labor Affairs of Executive Yuan (2012), in which the Council stated that the main objective of the loan is to enhance labor force participation rate, and eligible ventures should have less than five employees (proprietor not included).

Taken together, the investigators of this study defined micro-enterprises as business organizations with less than five employees (proprietor not included).

Definition of the Computers, Communications and Consumer Electronics Industry and its Status

The term computers, communications and consumer electronics industry is about companies manufacturing, distributing, or retailing computers, communications and consumer electronics products. With rapid advancement in information technology, these products have become part of our everyday life or even necessities. This technology advancement has been further integrated with art, making technology gadgets a symbol of status pursued by people as well as a fashion statement. In other words, because of human beings' innate tendency of following the trend, computers, communications and consumer electronics products have been transformed from everyday items into an icon denoting styles and fashion. Consequently, manufacturing, distributing, and retailing of these products become the mainstream and a powerful sector. The information technology (IT) industry in Taiwan is not only well known across the world but also a potent one. Many information and communication products made in Taiwan had the largest market share. Moreover, Taiwan is also a major nation manufacturing as well as supplying information and communication products around the world (Huang, 2009).

Definition of Entrepreneurs

According to Merriam-Webster Online, entrepreneurs are those “who organizes, manages, and assumes the risks of a business or enterprise” (Merriam-Webster Online, 2011). McClelland (1965) considered that both innovative managers with decision-making responsibility and business founding managers can both be regarded as entrepreneurs. Hornada and Aboud (1971) suggested that entrepreneurs are managers who have successfully started companies. To define entrepreneurs, Wu (2004) conducted a literature review and summarized all the available definitions for entrepreneurs. Wu (2004) found that most of the definitions included the following components: 1) creators capable of innovation, reform, and reorganization; 2) individuals willing to take responsibility for risks of uncertainty and ventures; 3) individuals capable of organizing, planning, and managing the entire organization or company; 4) individuals capable of integrating resources; and 5) individuals capable of seizing opportunities before their competitors. Combining these components, Wu (2004) defined entrepreneurs as

individuals with an entrepreneurial mindset and venture-oriented attitudes, and they have to be initiative and taking responsibility. Furthermore, they can appropriately and well apply social network and resources to discover and grasp opportunities for creating new business. Wu (2004) also simplified the definition into individuals creating new business ventures and being capable of taking risks and responsibilities as well as attaining goals.

Taken together, the main objective of this study is to investigate and analyze the entrepreneurial competency required for the retail – computers, communications and consumer electronics entrepreneurship. To do so, the investigators first defined computers, communications and consumer electronics entrepreneurs as proprietors setting up their own enterprises, using the Internet to carry out e-commerce services or product selling, taking the responsibilities and risks of the entire enterprise, devoting themselves in achieving the goals, and having a vision for the advantage of their enterprises.

Method of Competency Analysis

Competency catalogue is a list of analyzed competencies required to carry out a specific type of job or to develop a business. Competency catalogue includes information and documents of the competency needed for executing tasks of a job (Yang, 1984). The main purpose of competency analysis is to analyze and to comprehend the content of a job and the required competency of the job. Schools often used the information to train their students and to prepare them for the job market (Tai, 1988).

Systemic competency analysis is required for constructing suitable competency catalogues. In this study, the investigators conducted a literature review, an in-depth interview and Delphi technique-based questionnaire surveys for building up a competency catalogue for the retail – computers, communications and consumer electronics entrepreneurship.

Internet Entrepreneurship

Until April 2004, according to the Ministry of Transportation and Communications, more than 10.92 million people in Taiwan have surfed the internet. Over last month, there were still about 9.23 million people using the internet. National Information Infrastructure (NII) also pointed out that the percent of population in Taiwan doing online shopping had increased from 1.5% in 2000 to 6.7% in 2003. A well-known market survey company showed that in 2004, about 21% of web users in Taiwan had purchased something online, while 46% of them had at least one transaction (buy or sell) at online auction sites (<http://sme.moeasmea.gov.tw/SME/>, 2004). According to 2004 Domestic E-commerce Operation and Development Trend Analysis released by Institute for Information Industry, the market scale of online shopping had reached 34.72 billion dollars. In 2004, the total retail market revenue was 2,886.6 billion dollars, and about 1.2% of that came from the online retail sector (Liu, 2004). Market

Intelligence & Consulting Institute (MIC) reported that in 2008, the online shopping market scale was 243 billion dollars, demonstrating a 32.3% market growth compared to the year before. Specifically, online shopping had a market scale of 136 billion dollars, while the market scale for online auction was 107 billion dollars. In 2008, many consumers were attracted to do their shopping online because of the great convenience of online shopping in Taiwan, getting a better bargain from online stores (vs. physical retail stores), and more varieties of products available online (MIC, 2008).

In Taiwan, many people are interested in entrepreneurship and becoming a boss. To improve operation efficiency, Ministry of Economic Affairs implemented the E-shop Startup Counseling Program at its entrepreneurship website. Any newly opened and registered e-shop with more than three employees will be subsidized by the government for 30,000 NTD. Lin Sheng-chung, the vice minister of the Ministry of Economic Affairs, stated that even though the amount of the subsidy sounds trivial, i.e., 30,000 NTD per e-shop, the steadily lowering operating cost for e-shops, thanks to good collaboration with computers associations, should make 30,000 NTD quite sufficient for new business owners. He further mentioned that the objective of this subsidy from Ministry of Economic Affairs is not only about encouraging the opening of more e-shops but also about transforming conventional physical retail stores into web-based ones so they can do better in cost control and boost their performance (Ministry of Economic Affairs, 2009).

Advancement in web technology as well as the high penetration rate of web use has driven the flourishing of online shopping and the multiplying of web-based entrepreneurs. Web-based entrepreneurship has become an alternative option for people looking for jobs. Web-based entrepreneurship not only helps improve the employment rate but also promote economic development. Although there are several successful web-based entrepreneurship examples grasping the public attention, there are also unsuccessful cases due to a lack of web-based entrepreneurship knowledge and skills. These unsuccessful cases, however, are often forgotten or neglected. To encourage web-based entrepreneurship, it is therefore important to teach these entrepreneurs as well as prospective entrepreneurs relevant knowledge to increase the chance of success and to improve the management performance.

Research Design and Implementation

The objectives of this study are to analyze competency of web-based micro-entrepreneurs in the retail – computers, communications and consumer electronics industry and to establish a competency catalogue for entrepreneurs of this sector.

The competency catalogue for web-based micro-entrepreneurs in the retail – computers, communications and consumer electronics industry was established based on information collected from a literature review, an in-depth interview, and Delphi-based questionnaire surveys. The collected information was analyzed to determine professional competency required for this type of entrepreneurs. The research methods and steps are described below:

Literature Review

Studies related to web-based entrepreneurship were collected and reviewed systematically. The focus of the review was on defining the scope and content of web-based entrepreneurship. The information was integrated with empirical research evidence to determine work content and competency of web-based entrepreneurs as well as to prepare an outline for the in-depth interview.

In-depth Interview with Experts

According to job content, career competency development guidelines and career competency standards, three people with ample practical experience in web-based entrepreneurship were selected and interviewed based on an interview outline prepared by the investigators beforehand. The objective here is to understand the actual works involved in web-based entrepreneurship, and the obtained information was sorted for setting up the initial draft of the competency catalogue.

Delphi Technique

The main objective here is to develop a competency item survey questionnaire based on all the competencies obtained from the initial draft of the competency catalogue. Then, questionnaire survey experts were invited to validate the competency item survey questionnaire. Thereafter, professionals and academics (a total of eleven people) were recruited for taking Delphi-based questionnaire survey three times. Last, the investigators completed the competency catalogue for web-based micro-entrepreneurs of the retail – computers, communications and consumer electronics industry.

Data Analysis and Discussion

According to the objectives of this study, information collected from the literature review, in-depth interview with experts, content validation by experts, and three Delphi-based questionnaire surveys was analyzed, and the results are presented below:

The mode, mean, and standard deviation were calculated using data collected from the three Delphi-based questionnaire surveys answered by experts, academics and researchers. This information revealed the level of importance of each questionnaire item. Central and dispersion tendency of their opinions were reviewed as well. After conducting the third Delphi-based questionnaire survey, the investigators conducted Kappa test, Kappa test was applied to assess if there is a significant variation on opinions between experts from the academic field and those from the practical field.

Results from the Analysis of Delphi-based Questionnaire Survey

The study conducted Delphi-based questionnaire survey for three times, and experts reviewed the result before revising the questionnaire items and the corresponding choices. All the questionnaire items had an average greater than 3.5, i.e., reaching the significant standard given by Chang (1991), except No. 5 “Searching for appropriate business location” of Part A Web-based (e-commerce) Entrepreneurship Plan (list of works), which had only an average of 3. The investigators considered that the focus of the study should be on issues related to web-based micro-enterprises, and micro-enterprises are known for being virtual and home-based with few employees. As a result, majority experts considered this questionnaire item insignificant. Nonetheless, there were also some experts viewing this questionnaire item very significant. The investigators of this study would like to point out that even a web-based micro-enterprise needs a location, and there are various possible locations. At least, in the most froogle way, one would still need a personal computer at home to start the business. It can be found from the first to the third Delphi-based questionnaire survey that the standard deviation of majority questionnaire items had dropped, indicating minimized dispersion. That is, the level of agreement on questionnaire items showed an increasing tendency.

Kappa Test

Kappa test was used to understand if experts from the academic field and those from the practical field shared similar perspectives. Among the eight aspects, only the aspect of “Company Financial Management” had a K value of 0.235 and did not reach the significance level. This result indicates that the viewpoints between experts from the academic field and those from the practical field were inconsistent. For the other seven aspects, their K values were all significant.

Taken together, the investigators developed eight major aspects and a hundred and nine competency indicators and described them below:

Web-based (e-commerce) Entrepreneurship Plan (Work List)

1. Searching for potential market for computers, communications and consumer electronics online
2. The company’s overall financial planning
3. Establishing the company’s organization rules (coordinating with bookkeeper or accountant)
4. Naming the web-based company
5. Searching for a suitable business location
6. Understanding laws and regulations related to Computers, communications and consumer electronics products
7. Understanding laws and regulations related to online retail business
8. Developing computers, communication and consumer electronics for the retail business

9. Setting up the business location
10. Determining the operating model and software/hardware planning before starting the business
11. Conducting acceptance check of the business location
12. Understanding tax related knowledge (coordinating with bookkeeper or accountant)
13. Receipt registration and business registration (coordinating with bookkeeper or accountant)
14. Opening a corporate bank account
15. Applying for a merchant account for accepting credit card payment
16. Setting up an independent corporate website
17. Confirming the sources of computers, communications and consumer electronics products for the retail
18. Offering proprietor and staff training
19. Verifying the quality of computers, communications and consumer electronics products for the retail
20. Conducting pre-sale activities for computers, communications and consumer electronics products
21. Planning the opening activities of the company
22. Purchasing insurance for the proprietor(s) and the employees
23. Purchasing insurance for company's property
24. Determining the stop-loss point for the business operation
25. Exploring required legal protection, e.g., trademarks, patents, copyrights
26. Preparing market plans for computers, communications and consumer electronics products, e.g., logistic, contract signing
27. Vision and potential
28. Risk management
29. Determining shareholder exist mechanisms
30. Setting up short-term, mid-term and long-term goals
31. Setting up default market scale development
32. Determining a profitable business model for web-based business

Company's On-site Business Operation and Administration (Work List)

1. Setting up the business operation goals
2. Implementing the business operation goals
3. Reviewing the business operation goals
4. Setting up the standard work procedures
5. Implementing and supervising the work standard procedures
6. Retail strategies
7. Procurement decision for company operating supplies and equipment
8. Controlling the product and service quality
9. Maintaining the work environment
10. Holding operation and review meeting

11. Using smart phones, tablet computers or mini laptops for remote management
12. Project management
13. Customer relationship management

Company Finance Management (Work List)

1. Controlling the operating cost of the company
2. Product cost control
3. Operating cash flow management
4. Invoicing and payment handling
5. Equipment and other property management
6. Establishing fixed time inventory check system
7. Searching for sources of funding
8. Setting up zero inventory goals
9. Establishing good financial social relationships (e.g., banks and investor companies)

Company Operating Strategies (Work List)

1. Marketing positioning of computers, communication and consumer electronics products
2. Pricing strategies of computers, communications and consumer electronics products
3. Research and development of computers, communications and consumer electronics products
4. Market survey and analysis of computers, communications and consumer electronics products
5. Adjustment of the operating condition of computers, communications and consumer electronics products
6. Future development and planning of the company's retail of computers, communications and consumer electronics products
7. Integration and application of relevant resources
8. Innovation of company's operating strategies
9. Grasping operating strategies adopted by the opponents

Marketing Management of the Company (Work List)

1. Marketing plan for computers, communications and consumer electronics products
2. Promotional programs for computers, communications and consumer electronics products
3. Selecting media for computers, communications and consumer electronics products
4. Establishing customer service system
5. Becoming franchisee of the large-scale domestic online shopping companies,

- e.g., Yahoo, PCHOME for opening online stores
6. Establishing products related social network
 7. Establishing a customer database
 8. Integrating virtual and physical retail channels
 9. International marketing
 10. Joining free online auctions to increase the company's exposure rate, e.g., Yahoo and Ruten
 11. Advertisement campaign
 12. Participating in events of companies of the same industry
 13. Integrating the up- and down-stream supply chain
 14. Experiential marketing planning

Company Personnel Management (Work List)

1. Setting up the personnel system and regulations of the company
2. Setting up the pay structure/system of employees
3. Setting up the incentives/bonus system for full-time employees and partner(s)
4. Establishing job contents and responsibilities of employees
5. Setting up employees appraisal system
6. Talent seeking and recruitment
7. Employee on-job training and supervising
8. Severance package
9. Setting up the reward and punishment system

Crisis Management (Work List)

1. Customer complaint handling
2. Customer complaint follow-up
3. Public safety and accident handling
4. Nature disaster handling
5. Occupational injury handling
6. Legal handling of customer complaint
7. Legal dispute between employees and the company
8. Handling of legal disputes with opponents or the government
9. Setting up a spokesperson system

Entrepreneurship (Work and Attitude)

1. Organizing and managing the company
2. Being capable of taking the risk of company failure
3. Being capable of implementing innovative management and decision-making
4. Being the first discovering market opportunities
5. Discovering novel products or services
6. Being highly ambitious
7. Giving lasting efforts and possessing high morale

8. Being capable of profit making
9. Possessing high commitment and endurance
10. Taking challenges and implementing reform continuously
11. Being capable of risk taking and adventure loving
12. Being capable of resource integration
13. Taking the responsibility of the failure of one's company
14. Keeping acquiring new knowledge and learning novel ideas

Conclusion and Recommendation

The objectives of this study are to analyze competency of web-based micro-entrepreneurs from the retail - computers, communications and consumer electronics industry and to establish a competency catalogue for these entrepreneurs. The investigators developed eight aspects and a hundred and nine competency indicators for colleges, universities, and other relevant education institutes to use on preparing web-based entrepreneurship courses. The ultimately goal is to help web-based micro-entrepreneurs develop required competency for starting up their own business ventures.

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Perceived Deliberate Practice Activities of Chinese Vocational School Teachers

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ABSTRACT Many studies on deliberate practice focused on well-structured domains with clear criteria to evaluate performance, such as chess and type writing. However, fewer studies have investigated domains in which performance is more difficult to evaluate. The present study, therefore, investigated a domain with less clear criteria to evaluate performance: vocational school teaching. In particular, we investigated teachers' perception of activities that they consider essential to improve their performance (i.e., deliberate practice). The study has investigated 144 vocational school teachers with questionnaires. Results have shown that planning for lessons, and reflecting on teaching, are considered as essential practice activities by vocational school teachers to improve performance. Supervising students to participate in skill competitions and participating in teaching competitions are considered as essential activities by expert teachers. Other activities, such as being trained for subject knowledge, teaching strategies, and communicating with colleagues and students, are supporting activities, which can affect teachers' teaching performance mediated by planning for lessons, and reflecting on lessons. The implications of the study and suggestions for further research questions will be discussed.

KEYWORDS deliberate practice; vocational teaching; expertise development

Introduction

Chinese Vocational Teaching

Chinese educational system includes primary schools, secondary schools, high schools and vocational schools, universities and higher vocational colleges. Students will enter high schools or vocational schools according to their grades in the entrance examination after graduating from secondary schools. High school students study very hard to prepare for the National College Entrance Examination (named Gao Kao in Chinese), because the result of the examination will decide if they can be enrolled into

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universities or colleges and what kind of universities or higher vocational colleges they can enter. Although vocational school students also have chance to take the National College Entrance Examination to go to study in universities, it seldom happens. The main aim of vocational schools is to cultivate skilled labors for the industries.

Chinese education has changed a lot during the last 30 years. In 1980s, China lacked qualified people in all kinds of industries after the Cultural Revolution. Vocational school students could be displaced into a well-paid position by the government after graduation, and so it was very attractive for students to study in vocational schools. Vocational schools could also enroll high-quality students at that moment (Li, 2010). However, since 1990s, with more and more students graduating from universities, the situation of shortage of qualified people has changed. It became more and more difficult for vocational school students to find a well-paid job. They could only work as workers with low salary, while well-paid positions were more and more occupied by university graduates (Li, 2010). Consequently, vocational education has become less and less attractive for parents and students. Students' first choice is to go to high schools so that they can go to universities, while vocational schools have become the last option for low-achieving students who cannot enter high schools.

Vocational school students have experienced many failures during their studies, and often have developed learned helplessness in learning, which resulted in their low motivation to learn (Kang & Qu, 2011). In addition, they have developed inefficient learning strategies and bad learning habits (Kang & Qu, 2011). Vocational school teachers have therefore to invest a lot of effort in classroom management in order to give their lessons, since many students are easily distracted.

Since vocational education aims at training skilled and technical workers in all kinds of professions, vocational school teachers have to master relevant knowledge and skills. Vocational school teachers need professional knowledge and skills and knowledge about how to teach certain kind of skill. Additionally, they must know about the requirements of modern industry and business. Hence, they should also have some practical experience in enterprises so that they can combine theory with practice in teaching (Zhao, 2002).

During the last ten years, reform on curriculum and teaching in vocational schools has imposed higher requirements on vocational

school teachers (Wang, 2011). Educational administrations have organized many investigations on new curriculum and teaching in vocational schools. Schools are required to implement new curriculum and teaching models, and teachers are trained to teach in a new way. The most influential teaching model in vocational teaching is action-oriented teaching, which is based on the learning theory of constructivism (He, 2011). Furthermore, educational administrations organize teaching competitions to direct teachers to change their traditional teaching models and learn to teach in constructivist way.

However, there are still many problems in the reform on curriculum and teaching. For instance, teachers learn some new methods but do not know how to use them in their own teaching. They do not understand why new teaching models work, and have

not changed their conceptions of teaching (Zheng & Gerdsmeier, 2010). Some teachers organize teaching with a lot of activities but they still do not stimulate students' thinking and understanding. Obviously, many these challenges of vocational teaching are universal and not limited to Chinese vocational education (Zheng, 2010).

Hence, more and more researchers have realized that it is very important to improve the quality of vocational school teachers in order to change the teaching situation in vocational schools (Wu & Wang, 2008). In China, the Ministry of Education has implemented a Vocational School Teachers' Quality Improvement project (Chinese Ministry of Education, 2006). One part of the project is to develop training packages for vocational school teachers of different subjects. Another part is to train in-service vocational school teachers. The government has invested several hundred million Yuan in this project. In addition, every vocational school has teacher development policies and strategies. However, these kinds of policies and strategies are less based on scientific knowledge about how vocational school teachers acquire their expertise. Therefore, the practice of teacher development in vocational schools also calls for new insights on how to improve vocational school teachers' performance (Wu & Wang, 2008). Deliberate practice is one of the approaches to investigate how to improve teachers' performance.

Deliberate Practice

Ericsson, Krampe, and Tesch-Römer (1993) proposed the deliberate practice theory to explain the acquisition of expertise in many different areas. They argued that experts' acquisition of outstanding abilities cannot be explained by innate factors but is mainly the result of extensive experience and practice. They further distinguished expert performance and skilled everyday performance. Skilled everyday performance follows the skill-acquisition framework as proposed by Fitts and Posner (1967), and it consists of three stages: cognitive, associative and autonomous. Most people will stop pursuing improvement when they attain satisfactory level of competence through experience and practice. They will do their everyday work automatically. However, in order to keep improving their performance level, some people will intentionally monitor their performance, and try to avoid the limitations of the autonomous stage, i.e., if an activity has become automatic, it is more difficult to improve it.

According to Ericsson (2008), only those specially designed activities for the purpose of improving performance are most important in the acquisition of expertise, and only this kind of activities should be called deliberate practice. They distinguished the following characteristics of deliberate practice: First, practice activities should be designed for consciously improving performance level. Second, task difficulty should fall into the zone of proximity development (i.e., the problem should be challenging and within individual's reach; not too simple nor too complex). Third, it needs conscious effort and concentration and self-regulation (i.e., it is not automatically executed). Fourth, the activity needs high motivation to conduct and is often not pleasurable. Fifth, there is no immediate external encouragement or reward for this kind of activity. Sixth, performers should be given feedback so that they can correct their mistakes in time.

Seventh, activities demand high investments in physical and mental resources of performers, so that the time that performers engage in these activities should be limited in order avoid burnout or even physical damage (Ericsson, Nandagopal, & Roring, 2009).

Deliberate practice framework has been investigated in many areas and different forms of deliberate practice activities were identified. For instance, in music, practice alone is considered deliberate practice for violinists (Ericsson, 2006), while chess players regard studying previous played games of grand masters as deliberate practice (Charness, Tuffiash, Krampe, Reingold, & Vasyukova, 2005). Insurance agents regard mental simulation (i.e., imagining some difficult situation while meeting with customers and try to deal with it), and feedback from colleagues or experts as their deliberate practice activities (Sonntag, & Kleine, 2000). In the area of teaching, studies also identified some deliberate practice activities. For instance, Dun and Shriner (1999) found following deliberate practice activities for teachers: preparing materials for instructional activities, planning lessons in mind, written planning lessons and evaluating students. They further argued that although all teachers engage in these activities, their effect for teachers would be depended on their goals, efforts and consciousness. A study in China also found some deliberate practice activities for high school mathematics teachers: written planning for lessons, communication with colleagues, and accumulating extra-curricular mathematics exercises (Shi, Hao, Liang, & Li, 2009).

Given that deliberate practice has been demonstrated effective in so many areas, deliberate practice can also be an appropriate framework to better understand the acquisition of vocational school teachers' expertise. As indicated above, there have already been some studies on deliberate practice in teaching, but previous studies did not compare deliberate practice of teachers with different expertise level, which limits the implications for the research on teachers' training and development. In addition, there are no studies on vocational school teachers' perceived deliberate practice activities. Therefore, the present study tries to investigate perceived deliberate practice activities of vocational school teachers and to reveal the difference of deliberate practice activities of vocational teachers with different expertise level.

We hypothesize that vocational school teachers should engage in deliberate practice activities, and these activities should differ between teachers with different expertise levels. In addition, expert vocational teachers acquire their expertise not only because they invest more time in this kind of activities, but also because their different way in conducting the activities, i.e., quality of the activities.

Most popular methods of investigations on deliberate practice are interview, questionnaire, or diary. In the present study, we conducted a pilot study through interview to reveal perceived important activities of vocational school teachers with different expertise levels and find some potential activities to develop a questionnaire. Then we developed a questionnaire to investigate deliberate practice of vocational school teachers under Ericsson's framework.

Pilot Study

Our interviewees of pilot study included 10 vocational school teachers from the Shanghai area with about 10 year teaching experience (4 males and 6 females). We regarded 3 of them as expert teachers and other 7 teachers as experienced teachers. The interview was semi-structured. The following questions were asked. Which activities were most important for improving your teaching when you began your teaching work? And how about now? Could you give examples of activities that you consider important to improve your teaching? Please explain why these activities are important with the examples? Every interview lasted about 30 minutes and was recorded.

Since all teachers were asked about important activities when they began their teaching, so we have 10 novices, 7 experienced non-experts and 3 experts. The results are shown in Table 1. The percentages in the brackets are the populations of teachers who mentioned the activities in the interview.

Table 1
Perceived Important Activities of Vocational School Teachers

Type of Teacher	Activities
Novice teachers	- Preparing for lessons (50%)
	- Being trained for subject knowledge and pedagogical knowledge (50%)
	- Being supervised by experienced teachers (40%)
Experienced non-expert teachers	- Practice in enterprises, communicating with people in industry (60%)
	- Listening to public lessons and communicating with colleagues (60%)
Expert teachers	- Supervising students to participate in skill competitions(100%)
	- Participating in teaching competitions (100%)
	- Educational research (including editing textbooks) (100%)

Questionnaire Survey

Development of the Questionnaire

In order to develop the questionnaire, we asked 20 vocational school teachers to write down five activities that are important in improving their teaching performance. Combining with the result of our interview and previous studies (e.g., Dun & Shriner, 1999; Shi, et al., 2009), we got 20 potential activities (see Appendix).

According to Ericsson et al’s deliberate practice framework (1993), we arranged the activities in three dimensions: relevance, entertainment, and effort. The scale ranges

from 1 (lowest) to 9 (highest). In addition, we also asked teachers to estimate the time they engage in the activities (hours per week or per year). Then we developed the questionnaire of vocational school teachers' deliberate practice activities (see Appendix).

Participants

We distributed 203 questionnaires in six vocational schools in Shanghai and vocational school teachers from other places and 167 questionnaires were returned (82%). We excluded 23 participants because their questionnaires were not completely filled out, leaving 144 questionnaires for analysis. The demographic characteristic of the participants are shown in Table 2.

Table 2
The Demographic Characteristics of the Participants

Number (percentage)		Number (percentage)	
Gender		Degree	
male	50(34.7)	Bachelor	130(90.3)
female	94(65.3)	Master and above	14(9.7)
Age		Teaching Age	
below25	2 (1.4)	3	13 (9)
25-35	69 (47.9)	3-10	45 (31.2)
36-45	49 (34)	11-20	61 (42.4)
above 45	24 (16.7)	20	25 (17.4)
Title		Place	
not clear	7 (4.8)	Shanghai	121 (84)
primary	36 (25)	Other places	23(16)
intermediate	74 (51.4)		
senior	27 (18.8)		

In addition, 144 teachers learned different subjects for bachelor or master degree, including: civil engineering, urban planning, car engineering, English, international business, Chinese language and literature, transportation, water supply and drainage, painting, computer, educational technology, mathematics, politics, finance, chemistry, electronics, music, law, exhibition economy and management. Their teaching subjects also vary, some are fundamental subjects, like English, Chinese, mathematics, politics, physical education, and others are major subjects, such as international trade, logistics, computer, marketing, counting, Japanese, international settlement, webmaster system maintenance, finance, custom clearance, face-painting, aviation, tour management, locksmith practice, architectural graphing, decorative design, smith craft.

Results

We input the data into the software SPSS 16.0, using T-test to compare the mean result of each activity (see Table 3).

Table 3
The Mean Relevance, Effort and Entertainment of the Activities

Activities	Relevance(M)	Effort (M)	Entertainment(M)
Written planning for lessons	7.0694	6.8472	5.1528*L
Planning for lessons in mind	6.9861	7.0278**H	5.9931*L
Reading books that are helpful to teaching	7.1181	6.5833	7.0972
Reading information on the internet	7.0625	6.2292**L	7.0139*H
Analyzing syllabus, re-developing the textbook, choosing appropriate teaching contents and materials	7.1748*H	6.9301**H	6.0280*L
Reflecting on teaching	7.4236** H	7.0139**H	6.3403*H
Investigating and practicing in enterprises (including internship)	6.8254	6.4365H	6.8413
Organizing students to do internship and other practical activities in enterprises	6.6080*L	6.5760H	6.8880*H
Supervising students to participate in skill competitions	6.9692	7.2077**H	6.4077
Discussing with other teachers informally	6.8705	6.2014**L	6.5683
Supervised by expert teachers	6.7287	6.3023**L	6.2868*H
Teaching meeting in the teaching group	6.6241*L	6.1277**L	6.0000*L
Watching videos of excellent courses on the internet	6.5704**L	6.0986**L	6.3239*H

Discussing with professionals from enterprises or other schools	6.6176**L	6.2574**L	6.5662
Participating in open lessons or teaching competitions	6.8519	7.1185**H	6.2444*H
Continuing education for skill Certificates or degrees	6.9014	6.8028	6.4296
Being trained (including national, municipal, and school-based training and some lectures)	6.7589	6.6879	6.5177
Evaluating students informally (observing in class, Communicating with class teacher or other students)	6.8542	6.4028*H	6.5694
Communicating with students, encouraging them, and improving relationship with them	7.1736*H	6.7431	7.0069*H
Evaluating students formally (through tests and exercises)	7.0714	6.4892	5.8143*L
Average	6.912993	6.366319	6.171181

Note: ** indicates $P < 0.01$, * indicates $P < 0.05$, H indicates higher than average, L indicates lower than average. We also collected the data of the time that teachers engage in the activities, but many teachers did not fill this part. So we did not analyze these data.

According to the result, we can find that the following activities are of high relevance, high effort and low entertainment:

- (1) Analyzing syllabus, re-developing the textbook, choosing appropriate teaching contents and materials, and
- (2) Reflecting on teaching.
- (3) The following activity is of high relevance, high effort (not significant) and high entertainment: communicating with students, encouraging them, and improving relationship with them.
- (4) The following activities are of high effort. These activities are also of high relevance (although not significant):
- (5) Planning lessons in mind,
- (6) Participating in open lessons or teaching competitions,
- (7) Supervising students to participate in skill competitions, and
- (8) Evaluating students informally (observing in class, Communicating with class teacher or other students).
- (9) The following activities are of low entertainment:

- (10) Written planning lessons,
- (11) Planning lessons in mind,
- (12) Researching teaching syllabus, re-developing the text, choosing teaching content and materials,
- (13) Teaching reflection,
- (14) Supervised by expert teachers,
- (15) Teaching discussion organized by teaching groups,
- (16) Watching videos of other teachers' excellent teaching on the internet,
- (17) Participating in public lessons and teaching competitions, and
- (18) Evaluating students formally (through tests and exercises).

Discussion

According to Ericsson et al.'s framework (1993), we can regard the following activities as deliberate practice activities of Chinese vocational school teachers: (1) researching teaching syllabus, re-developing text, choosing teaching content and materials; and (2) teaching reflection. These activities have some characteristics of deliberate practice: high relevance, high effort, and low entertainment. Furthermore, the activity of researching teaching syllabus, re-developing text, choosing teaching content and materials is the essential part of planning lessons. Since planning lessons in mind and written planning lessons are also of high relevance (although not significant), high effort and low entertainment, we can combine these three activities together and name them as planning lessons; In addition, since these activities are everyday activities, teachers spend a lot of time on them.

If we combine the results of questionnaire survey with the pilot study, we can find that some activities are not everyday activities, and only some teachers have the chance to participate in them, for instance, supervising students to participate in skill competitions, participating in teaching competitions. These activities need high efforts and have low entertainment. Only expert teachers regard them as high relevant to their development. Teachers will spend more time in planning lessons and teaching reflections in order to get a prize. Schools also offer many supports to help teachers improve their teaching quality, because the prizes of the teaching competitions will enhance the school's reputation. Therefore, although these activities are not everyday activities, they can improve teachers' performance greatly.

Some activities are also helpful to teachers' development, such as (1) communicating with students, encouraging them, and improving relationship with them, (2) supervised by expert teachers, (3) teaching discussion organized by teaching groups, (4) watching videos of other teachers' excellent teaching on the internet, (5) evaluating students formally (through tests and exercises), and (6) evaluating students informally (observing in class, communicating with class teacher or other students). These

activities are of one or two of the criteria of deliberate practice, so they can not be regarded as deliberate practice activities. We call these activities as supporting activities. We assume that the effect of these activities is mediated by deliberate practice. The relationship between the three kinds of activities is shown in figure 1.

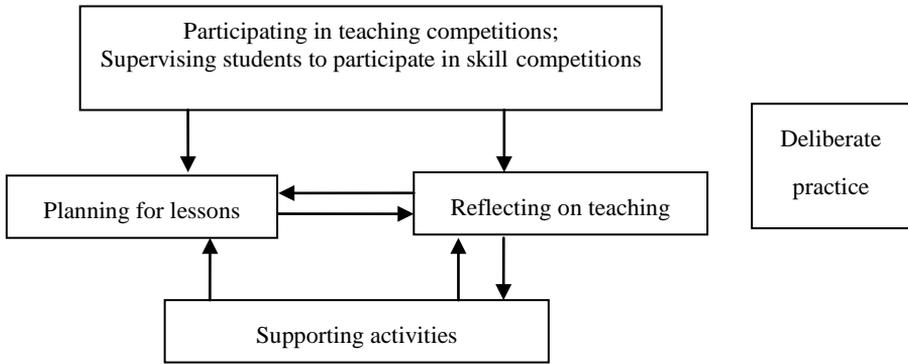


Figure 1. Relationship between the Three Kinds of Activities

The results of our study are in line with previous studies in some aspects. For instance, Dun and Shriner (1999) emphasized planning for lessons and evaluating students. They argued that evaluating students offer a good chance for reflecting on their own teaching. Shi et al. (2009) also emphasized planning for lessons. They emphasized accumulating exercises and discussing with colleagues, which is different from our study. A possible reason is that vocational schools have only a few teachers for one subject, so it is not easy to discuss with each other and get help from their colleagues. Whereas high schools have many mathematics teachers, it is beneficial to discuss with each other. Shi et al. (2009) found that only expert teachers pay more attention on teaching reflection, while our conclusion is that teaching reflection is deliberate practice of vocational school teachers. Maybe vocational school teachers face more difficulty in their teaching, which stimulates them to reflect on their teaching.

However, our research is still a primary investigation. It identified some deliberate practice activities in Chinese vocational school teachers, but further studies should be conducted to clarify what is the difference between how expert teachers and experienced non-expert teachers plan their lesson and reflect on their teaching.

General Discussion and Conclusions

Different Activities of Teachers with Different Expertise Level

Previous studies have shown novice teachers plan their teaching in detail. They concern about how to deliver the contents to the students (Hogan, Rabinowitz, & Craven, 2003). Since teachers need to master the subject knowledge, being trained and passing some examination is helpful for learning subject knowledge. Accepting supervision of experienced teachers includes listening to experienced teachers' lessons and asking experienced teachers to listen to their lessons and give feedback and suggestions. Listening to experienced teachers' lesson can help them get some teaching models. Experienced teachers listen to their lessons and give them feedback on their problems in teaching so that they can realize and correct their shortcoming in teaching. Communicating with students can improve the relationship between teacher and students, and get feedback from students.

Experienced teachers have some common places with novice teachers in helpful activities: being trained and communicating with students. Compared to novice teachers, experienced teachers and expert teachers all emphasize practice in enterprises and communicating with people in industries, listening to public lessons and communicating with colleagues out of schools. Experienced teachers emphasized teaching reflection, while all the three expert teachers emphasized supervising students to participate in skill competitions, participating in teaching competitions and educational research activities. Not every teacher has the chance of participating in these activities. Only those teachers who develop to some degree have the chance. And this chance improves their development vice versa.

We found that the result from questionnaire is in line with the definition of deliberate practice. While interview can reveal some difference between teachers of different expertise level, hence, explore the value of different activities further. Our conclusion is that planning for lessons and teaching reflections are deliberate practice activities. Especially, some deliberate practice activities for expert teachers are supervising students to participate in skill competitions, participating in public lessons and teaching competitions, since these activities can stimulate them to plan lessons and reflect on their teaching more deliberately.

In addition, we found that planning for lessons and teaching reflection are shown important deliberate practice in questionnaire research. However, they are less mentioned in interview. The possible explanation is that planning for lessons and teaching reflection are their everyday activities. They regard them as a part of their teaching. When they were asked what are important to improve their teaching abilities, they will only emphasize those activities that are not teaching itself and neglect some elements of teaching. When these activities are mentioned in questionnaire, they will be stimulated to realize its value in improving their teaching performance. This is an important difference between questionnaire and interview research.

The Criteria of Expert Vocational Teachers

As we have mentioned in other paper, compared to those well-structured domains with clear criteria to assess performance and identify experts such as sports, it is not easy to identify expert teachers, also vocational school teachers. In this article, we regard those teachers who won prizes in teaching competitions organized by Shanghai municipal educational administration as expert teachers. The reasons are as follows.

First, the criteria of selecting expert teachers are vague and vary with researchers' personal view. Some researchers comments that "expertise, like beauty, may be in the eye of the beholder." (Palmer, Stough, Burdenski, & Gonzales, 2005, p.23). In our opinion, the criteria of expert teachers can be distinguished in different teaching theories. In traditional context, teaching is regarded as transmitting knowledge to students, so expert teachers are identified according to their performance in explaining and lecture. However, teaching is regarded as helping students to construct and change their concepts in constructivism. In this context, the criteria of expert teachers should be very different.

Second, despite the problems in the reform on curriculum and teaching, it is clear that action-oriented teaching which is based on constructivist learning theory has become the mainstream direction of reform of vocational teaching (Xu, 2007). Hence, expert teachers in vocational schools should also be used to teaching in constructivist way, not good at teaching in traditional way.

Third, the teaching competitions are organized once for four years, and it is evaluated by the criteria of constructivist teaching, in order to direct teachers change their teaching model. Teachers who participate in the competitions have been strictly screened by schools in order to win prizes. Only several teachers who can organize their teaching well in constructivist way will won the prizes in one subject. Therefore it is efficient to screen expert teachers for the present study through this way.

The Implication on Teacher Development

Our study has some implications on vocational teacher development. First, we should encourage teachers to spend more time on planning for lessons and reflecting on their teaching. These activities are everyday activities and essential to their expertise development. They are also contents of vocational school teachers' work place learning. Second, the organization of students' skill competitions and teaching competitions is very important to teachers' development. Schools should encourage more teachers to engage in these activities and cultivate the atmosphere of teaching discussion and reflection. Finally, schools should also encourage teachers to improve their subject knowledge and practical knowledge through communicating with people from enterprises and other schools.

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A Study of Leadership Qualities in Vocational Education of Master Mariners

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ABSTRACT By an inference from an aviation accident, it is shown that shipping accidents may not be related to the leaders' knowledge and past training, but are more likely related to human errors. Taken one step further, the quality of the leadership is related to the leaders' attitude and personality. This study analyzes and surveys the elements of master mariners' leadership styles and weightings of each element. It finds that the quality of leadership depends on the leadership elements: contingency skills, professional skills, judgmental skills, motivating skills, and authoritative style. The survey finds that the master mariners and students attribute similar importance scores for each of the elements, indicating that students' perception is close to their future workplaces.

The survey also shows that master mariners treat contingency skills as the most important, whereas the students treat judgmental skills as the most important. Another observation is that both groups treat authoritative style as the least important, and this is considered to be due to advancements in modern communication systems such that shipping companies can better collect data and make decisions remotely. This situation leads to a change of leadership style for master mariners, from authoritarian to more cooperative teamwork styles.

KEY WORDS leadership, master-mariner, shipping, motivating, contingency

Background

In a study of an aviation accident in which over five hundred people were killed, The International Maritime Organization (IMO) concluded that the cause of the tragic collision of the two airplanes was a series of errors caused by communication breakdowns, and the biggest contributing factor was the attitude and autocratic

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leadership of the Capitan Pilot. Surprisingly, he was not only the most senior pilot, but also was responsible for training other pilots in the airline company. It was therefore clear that the accident was not caused by a lack of training; rather, it was caused by human errors, more specifically, caused by the personality and attitude of the leader. As such, IMO has organized a training course, Bridge Team Management for global marine and air crews.

From the above mentioned case, it can be seen that flawed attitudes and personalities of leaders can lead to disastrous human errors. This raises the questions: Can we study the attitude and personality of master mariners (a.k.a. captains) and link these to the performance and achievement of the management on ships? Are these attitudes and personalities relate to accidents at sea? What attitudes and personalities make good mariners? Can such attitudes and personalities be cultivated through vocational education for master mariners and for mariners?

Objectives

This study focuses mainly on the following issues:

- Identify the leadership qualities and traits that good master mariners should possess.
- Analyze the weights of respective traits.
- In addition to 1 and 2 above, this study attempts to identify traits for shipping companies to examine, assess and select master mariners with, and provides guiding principles for training and teaching of mariners and students.

Review of Literature

The study by Tsai Yu-Ming shows that international shipping depends on navigation of ships that in turn are under control of master mariners, and there are direct and indirect correlations between effectiveness of master mariners' management of the ships and that of the shipping industry. This is true in relation to national interest, marine environment, safety of lives at sea, and commercial interests of related parties. As a result of the growth on international shipping of individual countries, taking effect of various regulations and conventions co-developed by the United Nations and participating countries, the ever increasing generation and distribution of digital data, the progress in IT technologies, and the deployment of high-tech apparatus on ships, the shipping industry has changed, so have the role and status of the master mariners.

The legal status of master mariners has become more well classified and defined, and more complicated. In addition to ensuring proper operations of the ship and the cargo, they need to heed to ISM (International Safety Management) Code to ensure safe management and operation of ships and pollution prevention, ISPS (International Ship and Port facility Security) Code to enhance the security of ships and port facilities as a

responsibility for public security, and STCW (Standards of Training, Certification and Watchkeeping) to ensure proper certification and training for the mariners. There are laws from IMO on marine environmental protection, and from all nations on port security control and on the safety and management of the ships. In addition to these international and national laws, there are plenty of complications, in terms of navigating internationally, differences among the nations, timeliness, time and date differences, etc. All these make it hard for shipping company administrators to comprehend the issues and control the situations of the moments, so they are forced to delegate substantial powers and obligations to the master mariners. Besides, pending the contracting arrangements of the shipping entities, the master mariners can assume a variety of roles. Apart from being a person-in-charge of the ship and the management of the crews, a master mariner is one of the crews and can also be charged with the responsibility to represent for the country, the ship's owner, the consignee, the consignor, etc. (Tsai Yu-Ming, 2005).

In Zhong Yao-De's study of vocational functions and models of merchant master mariners, he ranks the traits by weight scores in the order of: influence and persuasion, organizational promises, relationship building, leadership styles, professional skills, interpersonal skills, self composure, decisiveness and confidence, personal development and training, fairness, and inter-team cooperation. (Zhong Yao-De, 2009)

In Huang Juan-Rong's study of private organizations in Taiwan, she examines effects of emotional behaviors of team leaders on team performance and team conflict, and concludes:

1. When a leader encourages the team members to express positive emotions and discourages display of negative emotions, the team's performance improves.
2. When a leader encourages the team members to show negative emotions and discourages expression of positive emotions, the team efficacy decreases and conflicts among team members increases.
3. The teams' Work Risk - the degree of the danger of the tasks, and Co-worker Exchange - the work relationship of the team members, are two factors that can affect the impact of the leader's style on the team performance.

The study shows that that while autocratic leadership style downgrades team performance (by incurring higher negative emotion and lower team spirit), this style does enhance awareness of the team members of the dangers, and is desirable for high risk working environments that requires cautiousness and circumspection. The reason is that what is needed to resolve the situation or danger is the best decisions and strategies, and not arguments.

Furthermore, the teams with high Co-worker Exchange and high Work Risk exhibit better resilience towards the leaders' emotional styles. When the leaders' styles are autocratic and restrictive, these teams have more reserve with which to counteract the negative impacts. (Huang Juan-Rong, 2009)

In Wu Ming-Lin's study on correlations among leadership style, personality, job satisfaction and job performance for officers, petty officers and seamen in the Taiwanese navy shows that:

1. Personal backgrounds have little influence on leadership style, personality, job satisfaction and job performance.
2. There is a strong correlation between leadership style and personality.
3. There is a strong correlation between leadership style and job performance.
4. There is a strong correlation between personality and job performance.

(Wu Ming-Lin, 2008)

In Jhong Ding's study of leadership styles based on the top 500 public (government owned) and private enterprises in Taiwan, his analysis shows there are four main leadership styles, based on their relative scores along the quadrants formed by two axes: relationship and performance.

- Commander style has low relationship score and high performance score
- Persuader style has high relationship score and high performance score
- Participant style has high relationship score and low performance score
- Delegator style has low relationship score and low performance score

There are strong correlations between two leadership styles: Commander and Participant, and four types of commitments by the team members: to give value to the company, to work hard, to stay on jobs and to offer total commitment. This means that by being task-oriented or people-oriented, the leaders can enhance the organizational commitments from the team members.

The study shows that the Commander leadership style is the most common among Taiwan's top 500 companies, meaning that these leaders obtain high performance scores and low relationship scores from their team members. This shows that these companies attach more importance to performance than to staff relationship.

Further analysis shows that leaders in public enterprises tend to adopt Participant style with high relationship score and low performance score. This is in line with general perception that these enterprises care more about staff satisfaction than overall performance. Contrarily, more leaders in private enterprises adopt Persuader style with high relationship score and high performance score. Again, this conforms to general perception that private enterprises treat both performance and staff relationship as equally important. (Jhong Ding, 2010)

Another study, done by Shi Rui-Xiang, surveyed officers and soldiers in the Taiwanese Army and Navy, to explore the relationship between a leader's power base and the subordinates' attitude. It finds a strong correlation between a leader's power base and the subordinates' attitude. (Shi Rui-Xiang, 2010).

In Sun Zhu-Hui's study of female student officers in 1999 and 2000 classes of the Taiwan Naval Academy, it has been shown that although there is no significant difference in adaptation of Transformational and Transactional leadership styles by male and female officers, there is a clear tendency for female officers to adopt a Transformational style for their leadership behavior. The main characteristics of the Transformational style are authoritarian, charismatic, supporting, and intellectually stimulating. It has been shown that during their practical terms in navy fleets, female officers are inclined to influence their subordinates through personal beliefs and values,

especially in authoritarian and supporting styles, and less often adopt the Transactional style with rewards or punitive measures as their leadership styles. (Sun Zhu-Hui, Han Xiang-lin, 2003)

In Wu Fang-Wen's study of demographic variables towards leadership styles, through military personnel in a Naval base in Taiwan, she concludes that the demographic variables for the three leadership styles: Paternalistic, Trusting and Knowledge Sharing are:

- Between both sexes, more male than female respondents accept moral based paternalistic styles of leadership.
- Among naval staff, more respondents with seniority between eleven to fifteen years accept knowledge sharing styles of leadership.
- More respondents with high school level education accept an authoritarian style of leadership compared to those with university degrees.
- Higher percentage of master degree respondents, compared to those with high school certificates, accept a moral based, Paternalistic style of leadership (Wu Fang-Wen, 2007)

Leadership in shipping is about leading and influencing others to behave utilizing coercive or influencing power (Kotter, 1990; Mintzberg, 1975). Each merchant ship is a microcosm of a society in an enclosed space, and the master mariner is the ship's highest authority who is empowered to represent the ship's owner. The master mariner applies coercion or authority powers to guide and actuate the crew to accomplish the company's goals. (Lin Zhen-Chun, 1994; Stogdill, 1974).

The principle of leadership is that a leaders applies a combination of elements: "Motivating Skills", "Contingency Skills", "Authoritative Style", "Professional Skills", "Judgmental Skills" to direct, guide and influence crew members, as a means to accomplish the goals of the companies. (Henry, 1975). While each of these elements contributes to the overall performance with a different weighting factor, the quality of leadership on merchant ships is measured by how close the performance meets the goals of the ship's operations. (Yi Kuang-Shih, 1994, Su Qing-Shou, 2007).

Based on the above studies, the quality of leadership on merchant ships cannot be measured without considering the interaction among the master mariners and the crews. (Lo Sin-hing, 2006; Charles & Suzy, 1996). Good leaders rely on adequate and correct applications of the leadership elements, to lead the crews to achieve company goals. (Charles & Suzy, 1996; Heifetz & Kaue, 1997). A master mariner must apply positive Motivating Skills to influence and coerce the crew to achieve the company's goals. Because ships travel across countries all over the world and in all sorts of conditions, a master mariner should possess Contingency Skills and adopt strategies to deal with the situations based on the time, the place and the people. Not only does a master mariner on a merchant ship represents the ship's owner, he is also empowered by international

laws to represent his country and to hold policing powers on the ship. As such he needs to adopt Authoritative Styles to assume sufficient leadership capacity to handle situations. A master mariner is the highest authority on the ship, therefore he should apply his Professional Skills to produce action plans for the crew. During the voyages across the oceans, if the ship does come across an emergency, such as bad weather, a violent storm, or a disastrous accident, the master mariner often has to rely on his own Judgmental Capability to make a suitable assessment and a timely and decisive response to solve the emergency. With the above mentioned leadership qualities, a master mariner can produce effective team energy to achieve the goals. (Sun Zhi-Hui, Han Xiang-Lin, 2003; Zhong Yao-De, 2009). However, because each crew member has his or her own background and skill level, and has requirements and expectation different to other members, the effectiveness of the leadership may be affected if this factor is not carefully dealt with. (Tsai Jin-Tian, 2010; Lo Sin-Hing, 2006; Joseph, 1998). The leadership behaviour affects the effectiveness of the crew, and the performance level of the crew reflects the quality of leadership. (Tsai Jin-Tian, 2010; Lo Sin-Hing, 2006; Thomas, 1996).

The quality of leadership on merchant ships is related to the key leadership elements of the master mariner, including motivating skills, contingency skills, personal leadership styles, professional skills, and judgmental skills. Often the weighting of each of these elements varies according to the characteristics of the organizations. (Tsai Pei-Cun, Wu Wen-Ying, 2004). From many of the empirical researches on the master mariners' leadership, it has been found that the ability to influence and to coerce crew members is the most crucial trait for the master mariners, therefore the weighting for the leadership element of Motivating Skills should be the highest among all elements. (Zhong Yao-De, 2009). Related studies also find that the importance of contingency skills and authoritative style is slightly lower than that of motivating skills. Sun Zhi-Hui, Han Xiang-Lin, 2003; Zhong Yao-De, 2009). In addition, an analysis of scores on professional skills and judgmental skills shows that these are often the least important among all leadership elements. (Zhong Yao-De, 2009). Based on the above analysis, the leadership elements and their relative weightings for the master mariners can be plotted as in the diagram below.

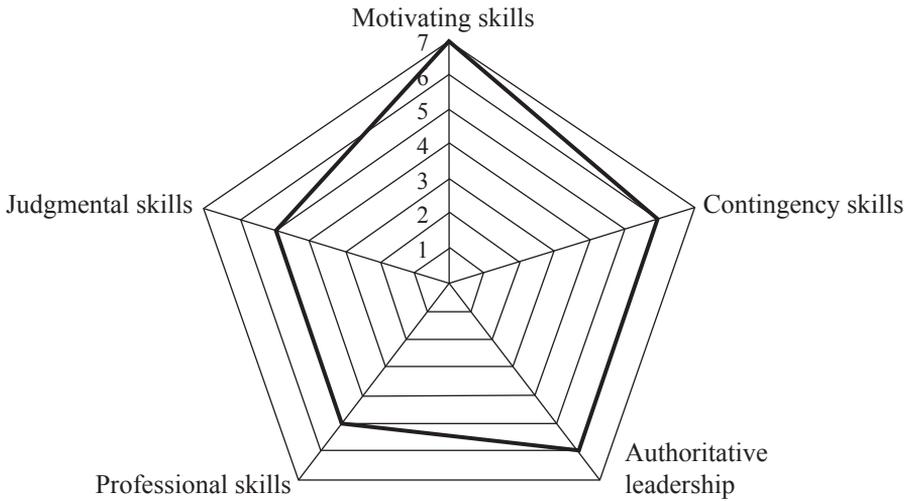


Figure 1. Leadership Elements and Their Weighting for Master Mariners

Hypothetical Model

1. Leadership qualities and effectiveness of master mariners are related to the five leadership elements: Motivation Skills, Contingency Skills, Authoritative Styles, Professional Skills and Judgmental Skills (Tsai Pei-Cun, Wu Wen-Ying, 2004; Zhong Yao-De, 2009; Liu Si-Yu, 2008).
2. The weighting of each of these elements varies according to the characteristics of the organizations. (Tsai Pei-Cun, Wu Wen-Ying, 2004). The ability to influence and to coerce crew members is the most crucial trait for the master mariners, and the weighting for the leadership element of Motivating Skills is the highest among all elements. (Zhong Yao-De, 2009). The importance of contingency skills and authoritative style is slightly lower than that of motivating skills. (Sun Zhi-Hui, Han Xiang-Lin, 2003; Zhong Yao-De, 2009). In addition, professional skills and judgmental skills are the least important among all leadership elements. (Zhong Yao-De, 2009).

Methodology

Participants of Study

Participants for this study include master mariners from a world-class shipping company, harbour pilots of the Kaohsiung Harbour, and all senior students in the Department of Shipping Technology in The National Kaohsiung Marine University.

Research Variables

1. Motivating Skills (personal charisma to inspire subordinates' morale)
2. Contingency Skills (Keeping to the organizational goals while practicing flexible strategies based on the situations.)
3. Authoritative Style (Self-confident with firm belief and determination to achieve goals)
4. Professional Skills (Professional knowledge with ample practical experience)
5. Judgmental Skills (Foresight and resolute decision making)

Research Instruments

This study uses questionnaires as the main tool. The questions cover the leadership element variables with seven scales, ranging from unimportant to extremely important, for each variable. Participants are asked to circle the scales against the variables, based on their perception of the importance of the variables.

Data Collection

Questionnaires were distributed to senior master mariners in various departments of the Evergreen Marine Corporation, and the harbor pilots of the Kaohsiung Harbor Pilot Association with a request to participate from the Director himself. Since harbor pilots are senior master mariners with excellent records, who have passed rigorous governmental examinations, they are considered to be elite master mariners.

Questionnaires were also given to senior students in the Department of Shipping Technology in National Kaohsiung Marine University, including third and fourth grade classes in the four-year technological and vocational course, first and second grade classes in the two-year vocational course, and the fourth and fifth grade classes of the five-year vocational course.

Data Analysis

The questionnaires were collected and processed for descriptive statistical analysis by using SPSS versions 18, by putting all the data received by questionnaires, to check the difference between the result of Mean and Standard Deviation.

Findings

The descriptive statistics result for master mariner, we find the highest score is "Contingency skills", the second is "Professional skills", the third is " Judgmental skills", and following is " Motivation skills" ,the last is " Authoritative leadership". Details see table one.

Table 1
The Result of Descriptive Statistics for Master Mariners

Master mariner	Sample	Min. Value	Max. Value	Mean	Standard Deviation
Motivating skills	33	5	7	6.27	0.801
Contingency skills	33	5	7	6.55	0.666
Authoritative leadership	33	4	7	5.58	0.867
Professional skills	33	5	7	6.45	0.617
Judgmental skills	33	4	7	6.39	0.827
Effect N	33				

The descriptive statistics result for students of The Kaohsiung Marine University, we find the highest score is “Judgmental skills”, the second is “Professional skills”, the third is “Motivation skills”, and following is “Contingency skills” ,the last is “Authoritative leadership”. Details see table one.

Table 2
The Result of Descriptive Statistics for Students

Students	Sample	Min. Value	Max Value	Mean	Standard Deviation
Motivating skills	151	4	7	6.46	0.764
Contingency skills	151	4	7	6.34	0.886
Authoritative leadership	151	3	7	5.84	1.195
Professional skills	151	4	7	6.54	0.755
Judgmental skills	151	4	7	6.66	0.612
Effect N	151				

The two sets of the results, one from master mariners, and one from students in the vocational marine shipping course, are compared, tabulated and charted as below.

Table 3
The Comparison of Results from Master Mariners and Students

Variables	Mean of Master Mariner	Mean of senior students	Research variables
Motivating skills	6.27	6.46	(charisma can inspire subordinates morale)
Contingency skills	6.55	6.34	Contingency ability (loyal to the mission, but also to be able to adjust in response to changes in decision-making)
Authoritative leadership	5.58	5.84	Authoritarian leadership (extreme self-confidence and firm belief in the strong implementation of tasks)
Professional skills	6.45	6.54	Professional skills (the industry knowledge and practical experience)
Judgmental skills	6.39	6.66	Judgment (vision and bold decisions)
Sample no.	33	151	

The two sets of results are graphed using a radar chart. The differences between the two groups, master mariners and students, are shown below.

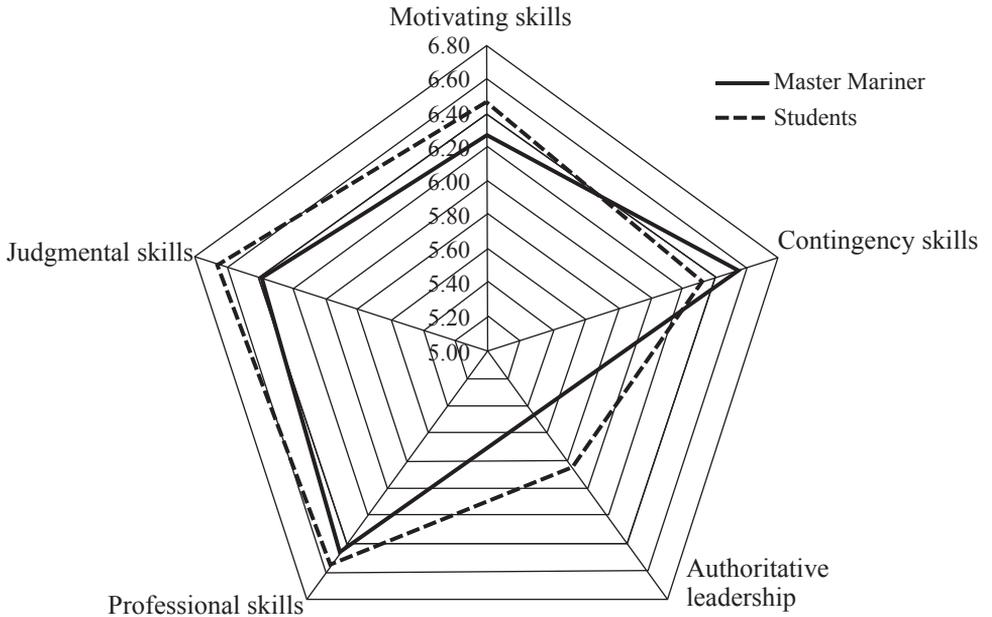


Figure 2. Comparison of the Results from the Two Groups: Master Mariners and Students

Conclusions and Suggestions

1. From the statistical results, it can be seen that the graphs for the variables as seen by master mariners and by students are similar, indicating that students' perceptions on shipping leadership are close to those of their future workplaces.
2. A comparison of the results of this study and literature of past studies, show that the rankings are different:

From other literature: (1) motivating skills, (2) contingency skills, (3) authoritative style, (4) professional skills, and (5) judgmental skills.

From master mariners: (1) contingency skills, (2) professional skills, (3) judgmental skills, (4) motivating skills, and (5) authoritative style.

From students: (1) judgmental skills, (2) professional skills, (3) motivating skills, (4) contingency skills, and (5) authoritative style.

An analysis of the above results shows that master mariners place more importance on contingency skills because, with their rich experience and well trained judgmental skills, they need to deal with all sorts of unforeseen and unexpected external factors, such as changing weather and environment with ships moving around in waters affected by human factors, navigational regulation, shipping traffic changes, etc. As for the students, due to their lack of experience, they place judgmental skills as the more important variable.

Both the master mariners and students place the same importance scores on professional skills and on motivating skills.

The leadership variable of authoritative style received the lowest scores from both the master mariners and the students. This result is very different to previous studies and needs to be highlighted. This is because nowadays communication technologies have advanced to the extent that the administrators of the shipping companies can access shipping data from the ships, almost instantly, and can make decisions using abundant internal resources. This is very different to the days when they could only rely on the marine masters for every decision with regard to the ship. When some of the power of decision making is transferred back to the companies, the authority of the master mariners may be challenged or queried easily. Furthermore, with the missions and goals clearly set for everyone, the teamwork concepts that cultivate the cooperative spirit of the crew will become the mainstream values.

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Structure of Students' Consciousness at the Time of Entrance Technical High Schools in Japan

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ABSTRACT The purpose of this study is to explore the structure of students' consciousness at the time of entrance technical high schools in Japan. A survey was conducted on 832 tenth-grade technical high school students. We carried out the text-mining analysis based on the students' responses by using software TAFS. The result of this, we can classify 11 "Consciousness-categories" such as "Expectation for after graduation"(466, 60.0%), "Motivation for specialized (technology) subjects"(326, 42.0%) and "Learning motivation for specialized knowledge and skills"(451, 58.0%). Based on this result, we tried to find an association between 11 consciousness-categories and students' self-concept. As to results, we expect that many consciousness-categories play a role to build the basics of self-concept. Also we tried to grasp the structure of students' consciousness at the time of the school entrance by using quantification method of the third type. The result of this, we could identify two axes, and we found that students who are the latest graduate from junior high school have two viewpoints with "Self validation for own career" and "Values for learning experience".

KEY WORDS technical high school, students, consciousness, self-concept

Introduction

The academic year runs from April to March in Japan. In the case of senior high school, students have to take the entrance examinations because senior high school is not compulsory education in Japan. Japanese compulsory educations are primary school and junior high school. Therefore junior high school graduates enter senior high schools

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upon passing entrance examinations. Some 99% of Japanese students attend high school. We can classify senior high school into 2 broad categories. These are general education and vocational education. About 72% of students enter General Senior High School, and 28% enter Vocational Senior High School (2007). The general senior high school is an extension of junior high school. Students mainly study general subjects, for example, Japanese, Math, English, Science, Social Studies and so on. After graduation, more than 80% of students go to the next stage of education including university, junior college and vocational school. On the other hand, there are many kinds of vocational senior high schools, including Technical high school, Commercial High school, Agricultural High School and so on. These schools have many specialized subjects and active studies in addition to general subjects. After graduation, more than 50% of students get a job (2009). In this study, we focus on the technical high school of vocational education.

The aim of technical high schools is to train young engineers to support the technological society of future Japan. This course is placed as a part of vocational education from senior high school level (from 10th to 12th grade). There are a lot of courses in technical high school, including electrical engineering, mechanical engineering, construction technology, textile technology, information technology, fabrication, metalworking and civil engineering. It is expected that students will learn specialized skills and knowledge in these courses (Course of Study, Government of Japan, 1999).

Generally, it is important for school education to form the students' self-concept with their scholarship. Self-concept can be defined as the concept of oneself that is found by all life experiences (Rogers & Dymond 1954). We reported to have analyzed the structure of technical high school students' self-concepts before (Shimada, Moriyama & Matsuura, 2007). In this research, a survey was conducted on technical high school students in Japan. A factor analysis was carried out, and five factors were identified: F1, attitude toward self-discipline; F2, attitude toward career development; F3, attitude toward professional skill development; F4, attitude toward social values; and F5, attitude toward self-monitoring. It is suggested that the structure of students' self-concepts in technical high school includes these five components. Based on this research, we realized that it is important to promote these 5 factors among students in the technical high schools. In addition, we researched the interrelations between students' self-concept and their consciousness for "Practical Study" in technical education (2006a). We also analyzed the effect of production activities in "Project Study" on students' self-concept in technical high school (2006b). "Practical Study" and "Project Study" are representative lectures of technical high school education in Japan. As a result, we pointed out that these practical learning experiences had good effects on promoting students' self-concept. However our above research has not shown that structure of students' consciousness at the time of entrance technical high school yet. It is important that we analyze the consciousness of students leading to the self-concept formation.

Objectives

From the above mentioned, it is important to grasp the structure of technical high school students' consciousness in Japan. Therefore the purpose of this study is to explore the structure of students' consciousness at the time of the entrance to technical high schools in Japan.

Method of Research

Subject

The subjects were 832 tenth-grade students in a technical high school at Oita, Osaka, Shiga and Tottori prefecture in Japan (They entered to schools in April 2012), with 777 students (93.4%) returning valid responses.

Questions

The questions were related to what the students thought about themselves, and they were allowed to answer, as they liked in the following 4 topics; 1) The reason students chose technical high school, 2) Motivation of school life, 3) How they feel themselves and technical high school, 4) Foresight of after graduation (job-hunter / college-bound or others).

Procedures

The survey was carried out in April 2012. After the survey is done, firstly, we classified the students' responses and we made "Consciousness-categories" by text-mining analysis. We used the software SPSS Text Analytics for Surveys (TAFS) produced by IBM. Secondly, we discussed the relevance between Consciousness-categories and Self-concept. In addition we analyzed the structure of these categories by using the quantification method of the third type.

Results and Discussions

Students' "Consciousness-categories" at the Time of School Entrance

We carried out the text-mining analysis with TAFS software to identify and categorize responses (question topics 1 to 3) that appeared with a frequency of 4.0% or more. The result of this, we could classify 11 "Consciousness-categories" (see Table 1 to 3). These are "Expectation for after graduation"(466, 60.0%), "Motivation for specialized (technology) subjects"(326, 42.0%), "Learning motivation for specialized knowledge and skills"(451, 58.0%), "Motivation for qualification acquisition"(319, 41.1%), "Motivation for making things"(174, 22.4%), "Motivation for extracurricular activities"(164, 21.1%), "Impression as a technical high school student"(92, 11.8%),

“Feeling about technical high school (rule, human-relations)”(66, 8.5%), “Motivation for school life”(219, 28.2%), “Negative self-image”(99, 12.7%), “Positive self-image” (36, 4.6%).

Table1
Categories of “The Reason Students Chose Technical High School”

Students' Responses	Category	Appearance Frequency (%)
I want to become a engineer after graduation. I want to work in a technology-related company. I am planning to go to University after graduation.	Expectation for after Graduation	466 (60.0%)
I am interested in technology. I like making things and machine operation. I like active studies.	Motivation for Specialized (technology) Subjects	326 (42.0%)

Table2
Categories of “Motivation for school life”

Students' Responses	Category	Appearance Frequency (%)
I want to learn about machines.. I want to get a specialize electrical engineering. I want to operate many machines..	Learning motivation For specialized Knowledge and Skills	451 (58.0%)
I will try to get a lot of qualification.. I want to get a “electrical worker” qualification.	Motivation for Qualification	319 (41.1%)
I want to make a robot. I would like to build civil structures. I want to make something useful for others	Motivation for Making Things	174 (22.4%)
I want to be active in my club. I will participate in the championship. I want to continue the club for 3 years.	Motivation for ExtraCurricular Activites	164 (21.1%)

Table3
Categories of “How they feel themselves and technical high school”

Students' Responses	Category	Appearance Frequency (%)
About technical high school		
I am very happy to enter this school. I feel fulfilled in school life. I feel uncomfortable in unfamiliar surroundings.	Impression as a Technical High School Student	92 (11.8%)
Technical high school has strict rules. The teachers are very strict with us. My seniors are very strict with us.	Feeling about Technical High School (rule, human-relations)	66 (8.5%)
About themselves		
I want to take active steps to find employment. I want to learn about many things.	Motivation for School Life	219 (28.2%)
I think that I am not good enough yet. I feel unsure of myself.	Negative Self-image	99 (12.7%)
I have a strong sense of responsibility. I feel I have matured.	Positive Self-image	36 (4.6%)

N=777

In addition, we tallied responses to question topic 4. As a result, we can classify students into roughly three groups (see Figure 1). These are “Job-hunter”(518, 57.4%), “College-bound”(139, 15.4%) and “Others”(246, 27.2%). Students of “others” are still thinking about what to do with their future.

Therefore, we can see that students have high aim to become an engineer. Also we found that a lot of students have a “future self-image” and a “sense of expectation for the future”.

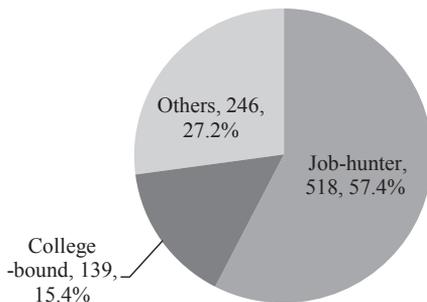


Figure 1. Foresight of after Graduation

Relevance between Consciousness-categories and Self-concept

Based on the results of the above-mentioned, we tried to find an association between the 11 consciousness-categories and the students' self-concept.

As presented above (1. Introduction), we identified five factors of the students' self-concept: F1, attitude toward self-discipline; F2, attitude toward career development; F3, attitude toward professional skill development; F4, attitude toward social values; and F5, attitude toward self-monitoring. In the past, Adachi (1990) examined the self-concept at junior high school level, there has not been any research that examined the structure of students' self-concept in technical high school in Japan. In our previous study, we grasped the students' structures of self-concept (above-mentioned 5 factors) in vocational education based on this "conceptual framework of self-concept (including 16 key word)", which was proposed by Adachi's research (see Table 4).

For our study's discussion, we used Adachi's self-concept framework again as a reference. We who are four professors and three technology teachers discussed the association between 11 consciousness-categories and students' self-concept with regard to the students' situation and Adachi's framework.

Table 5 shows the results. We can see that 10 consciousness-categories were classified in 5 factors of the self-concept. Many categories correspond to F1 and F3 especially. However, only one category corresponded to F4. On the other hand, category of "Impression as a technical high school student" was not related to the factors of self-concept.

Table4
Conceptual Frame of Self-concept (Adachi, 1990)

Large Categories	No.	Key Word
Increase of Potential Possibility	1	Knowledge
	2	Idea
	3	Skill
	4	Interests and Concerns
	5	Manners
	6	Values
	7	Motivation
	8	Human Relations
	9	Self-control
	10	Self-efficacy and confidence
View in the Future to Develop Potentialities	11	Knowledge about career
	12	Values towards career
	13	Desired occupation
	14	Current self-image
	15	Future self-image
	16	Self-image that observed from others

Table5
Relevance between Consciousness-categories and Self-concept

<u>F1. Attitude toward Self-discipline</u>
Motivation for school life, Motivation for making things*, Motivation for extracurricular activities, Positive self-image* Feeling about technical high school (rule, human-relations)*
<u>F2. Attitude toward Career Development</u>
Expectation for after graduation, Motivation for qualification acquisition*
<u>F3. Attitude toward Professional Skill Development</u>
Motivation for qualification acquisition*, Motivation for making things* Learning motivation for specialized knowledge and skills Motivation for specialized (technology) subjects
<u>F4. Attitude toward Social Values</u>
Felling about technical high school (rule, human-relations)*
<u>F5. Attitude toward Self-monitoring</u>
Negative self-image, Positive self-image*

* duplicative category

Therefore, on the whole, we expect that many consciousness-categories play a role to build the basics of self-concept. Also, it is thought that F4, attitude toward social values is formed in high school life after entrance. However, we should make a continual study of these findings by longitudinal-design study.

Structure of Students’ Consciousness at the Time of School Entrance

We also tried to grasp the structure of students’ consciousness at the time of the school entrance by using quantification method of third type. This analysis method is to investigate students’ consciousness from the qualitative data such as descriptive data and textual data. For this analysis, we set dummy variables as “1 or 0”. Students who described a consciousness category with their responses to our question items were designated as “1” in that consciousness category. Students who did not describe a consciousness category were designated as “0” in that category. After that, we analyzed between 11 consciousness-categories and responses of students using the “1 or 0” data.

As a result of quantification method of third type, we could identify two axes about consciousness categories. We plotted a graph based on the category scores of the two axes. (see Figure 2).

Firstly about the 1st axis, we could section that “Impression as a technical high school”(category score: 3.19) and “Feeling about technical high school”(category score: 1.48) are strongly positives. Also “Positive self-image”(category score: -4.73) and

“Negative self-image”(category score: -2.13) are strongly negatives. In addition other categories were plotted near the “ 0 ” of the 1st axis. “Impression as a technical high school” and “Feeling about technical high school” are related to “Reflection of career selection” about entrance into technical high school. On the other hand, “Positive self-image” and “Negative self-image” mean “Reflection of self-image” at the inner surface. Therefore we interpreted the 1st axis as “Self validation for own career”.

Secondly about 2nd axis, we could section that “Motivation for making things”(category score: 1.74), “Motivation for specialized subjects”(category score: 1.10) and “Learning motivation for specialized knowledge and skills”(category score: 0.75) are relatively-strong positives. Also “Motivation for qualification acquisition”(category score: -1.33), “Motivation for extracurricular activities”(category score: -1.28), “Positive self-image”(category score: -0.96) and “Expectation for after graduation”(category score: -0.78) are relatively-strong negatives. Categories that are positive are related to “Development for technological professions”. On the other hand, categories that are negative are related to “Social development”. Therefore we interpreted the 2nd axis as “Values for learning experience”.

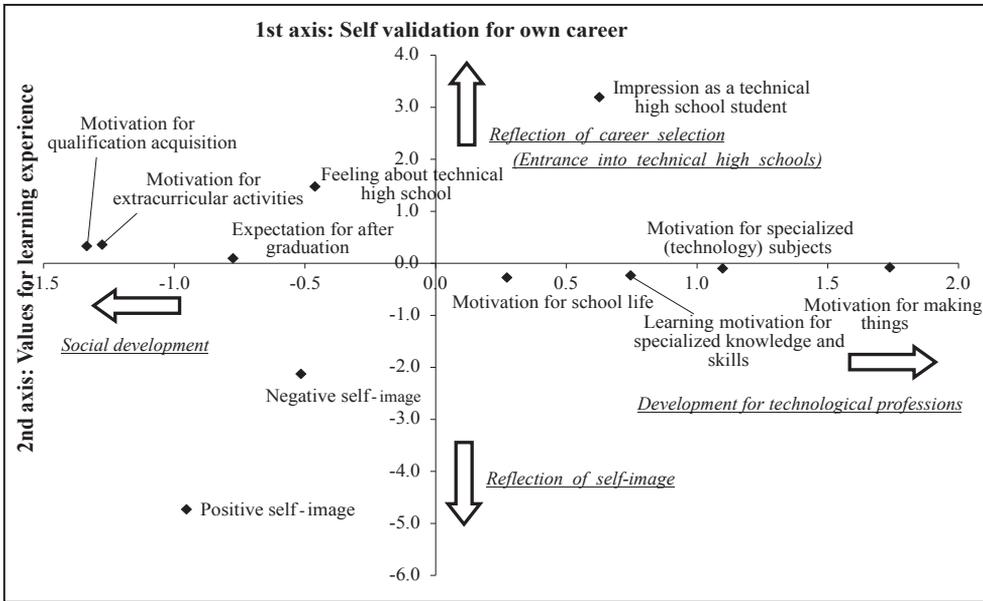


Figure 2. Students’ Consciousness Axes at the Time of School Entrance (Results of the Quantification Method of the Third Type)

From these results, we found that students who are the latest graduate from junior high school have two viewpoints, “Self validation for own career” and “Values for learning experience”.

Conclusion

From these results, we could grasp the students' consciousness at the time of the entrance to technical high schools. The main findings are as follow;

- (1) A survey was conducted on 832 tenth-grade technical high school students. We carried out the text-mining analysis based on the students' responses by using TAFS software. The result of this, we could classify 11 "Consciousness-categories" such as "Expectation for after graduation"(466, 60.0%), "Motivation for specialized (technology) subjects"(326, 42.0%), and "Learning motivation for specialized knowledge and skills"(451, 58.0%).
- (2) Based on the results of the above-mentioned, we tried to find an association between the 11 consciousness-categories and the students' self-concept with regard to the students' situation and Adachi's framework. As a result of this, we expect that many consciousness-categories play a role to build the basics of self-concept. However, we should make a continual study of this finding by longitudinal-design study.
- (3) Also we tried to grasp the structure of students' consciousness at the time of school entrance by using quantification method of third type. As a result of this analysis, we could identify two axes, and we found that students who are the latest graduate from junior high school have two viewpoints, "Self validation for own career" and "Values for learning experience".

Finally, for future study purposes, we would take note of the changes of these students' consciousness in school life after entrance. Also we are interested in the effect on the students' self-concept of these categories. We would also tackle the above-mentioned.

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Technological Thinking Disposition of Meister High School Students

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ABSTRACT The purpose of this study was to identify the Meister high school students' technological thinking disposition in order to enhance the effectiveness of educational activities that taking place in Meister high school. In order to achieve the purpose 1,312 high school students were selected for this study, among which there were 413 Meister high school students and 899 General high school students. Technological thinking disposition measurement instrument was used to identify the Meister high school students' technological thinking disposition. This instrument consists of 6 factors and 38 items. The reliability of each factors showed from .774 to .884. Conclusions obtained from this study are as follows; First, through the results of this study it was concluded that Meister high school students' technological thinking disposition is the more high than General high school students. So when we make a curriculum and content of Meister high school we should consider the students' technological thinking disposition. Second, there were differences of male and female students' technological thinking disposition in Meister high school. So when having actual educational activities we need to consider male and female students' technological thinking disposition and have to make differentiate educational plans between two genders. Recommendations on the basis of the results are as follows; First, through this study Meister high school students' technological thinking dispositions were identified. The careful analysis of these results will be needed to deduct the educational teaching method that suitable for Meister high school student. Second, in this study we identified the differences of students' technological thinking disposition between Meister and General high school, but to obtain more valuable resources additional studies such as investigation about other type's vocational high school students' technological thinking disposition are needed.

KEY WORDS technological thinking disposition, meister high school

Introduction

Necessity and Purpose of Study

Recently, as society has become more advanced and complicated with the advent of knowledge-based society, the importance of human's thinking gradually growing than ever before(Nam, 2010).

As a result, around the world many countries make a variety of efforts at the national level to foster the talented student who has higher level of thinking. U. S. National Science Foundation includes Cogno in the future science and technology's four core axis with Nano, Bio, and Info(Roco & Bainbridge, 2002). IBM Almaden research center also includes cogno system as one of the five systems of future science and technology to cultivate the talented person that based on the thinking(Lee, 2009).

Korea government also makes several efforts to strengthen the national competitiveness through nurturing the talented students. As a part of such efforts Meister high school has been operating from 2010 school year. Meister high school was influenced by Germany's unique system. The purpose of Meister high school is to operate the customized curriculum in order to meet the industrial site's demand and nurturing the technicians.

Llinas(2002) said "thinking is a internalized behavior, and the ultimate goal of thinking is human's proper behavior". This suggestion implies so much to Meister high school that emphasizes the practical activities.

However, most of the high school proceed the theoretical and practical class without accurate understanding of the students' individual disposition, so they did not maximize the educational activities(Nam, 2010).

In order to successful settlement of Meister high school, it is important to identify the characteristics of students as well as makes incentives to attract good students. It will be possible to spread out the appropriate educational activities if we can identify the student's thinking disposition. But such studies are still insufficient.

Recently, study on the thinking disposition has been briskly performed unlike the previous studies that only emphasize the thinking ability. Because to make a good thinking the balance between thinking disposition and thinking ability should be achieved(Tishman & Andrade, 2009).

In this context, systematic study to identify the Meister high school students' technological thinking disposition is needed.

The purpose of this study is to identify the Meister high school students' technological thinking disposition in order to enhance the effectiveness of educational activities that taking place in Meister high school.

Background

Meister High School

Classification of Vocational High School

At the high school level in Korea, there are Meister high school, Specialized high school, Vocational high school and General high school(The Ministry of Education, Science and Technology, 2010).

Table 1
Types of Vocational High School in Korea

	Meister	Specialized	Vocational (Formerly Industrial)	General
Purpose	Foster industry customized tech staff for actual work	Specialized education based on students' talent and aptitude	Foster tech-staff for actual work	The type that general/vocational high school is operated in one school in farming and fishery regions where students' numbers are small
History	Since 2008	Since 1998	Since 1899 (Title changed in 2006: Industrial -> Vocational)	Since 1956
Status	21 high schools including Ulsan, Dong-Ah Meister, etc.	168 schools such as robot, animation, internet high schools, etc.	275 schools including farming, commercial, engineering high schools, etc.	187 Schools(Cannot distinguish the title from usual type of high school)
Student Selection	Nationwide	Nationwide		
Curriculum	Autonomy (50% change of Common Curriculum available)	Autonomy (35% change of common curriculum available)	No additional autonomy	No additional autonomy

Source: The Ministry of Education, Science and Technology (2010). Enhancement Methods of Vocational Education in High School

The Main Role of Vocational Education at the Stage of High School

Curriculum of vocational high schools emphasize the performance ability at industrial sites after academic achievement in school and graduation, plan and operate education courses focusing on preparation for jobs and emphasizes collaboration between industry and academy. In addition, the nation supports and participates a lot. There is distinction in the points that objective data of school and industrial society are based and types of various curricula are generally considered (Ma, 2004).

Situation of Meister High School

The goal of Meister high school is to operate the customized curriculum in order to meet the industrial site's demand, and to solve the problem of the existing vocational high schools and nurturing the scientists, engineers, and technicians that is needed in industry field. Meister high school is influenced by Germany's unique personnel system. In Germany Meister refers the person that has the best actual field experience and hand skills. In Korea Meister high school begins 2010 with 21 schools, and every year the number of schools is gradually increased. 35 schools are now opened and total students' numbers are 5,190. The designated fields of Meister high school are various such as energy, automobile, mechatronics, medical equipment, semiconductor equipment, iron and steel, shipbuilding, machine, electronics, and new media contents. The tuition's of Meister high school students are exempted and school provide dormitory to all students. After graduating they can defer the military service for four years, and they are provided 100% employment.

Technological Thinking Disposition

Technological Thinking

Technological thinking is the ability to solve technological problems using cognitive skills such as system thinking, problem solving, planning and preparation, decision-making, application and evaluation(Chen & Stroup, 1993; Simon, 1985). This is a person's ability to overcome his physical limitations and aimed at addressing human's needs(Chen, 1996, 1998; Mioduser, 1998). Hill & Wicklein(1999) classified technological thinking into 5 factors such as researching for problem, searching for solutions, innovation, analyzing data, evaluating results. Mioduser (1998) said that the technological thinking includes two key components: the first refers to a repertoire of technological primitives that entail four categories: rudiments, mental models, method and meta-knowledge. The second component of technological thinking refers to learning space and technological problem solving. In this model, the learning space in technological thinking involves five levels, where each level includes features from previous levels: knowledgeable user, problem-solver, technology practitioner, craftsman and expert. Wicklein & Rojewski(1999) classified process of technological thinking into 27 items. Analyzing, Communicating, Computing, Creating, Defining Problem(s), Designing, Experimenting, Interpreting Data, Managing, Measuring, Modeling, Model (prototype) construction, Observing, Predicting, Questioning & Hypothesizing, Testing, Visualizing, Contexts, Customer analysis, Establishing need, Innovation, Monitoring data, Researching, Searching for solutions, Technology review, Transfer/Transformation, Values. Nam(2010) said that the core of technological thinking is creative practice and this is the most biggest feature of technological thinking distinguish from other thinking. And he also said that during the technological thinking process critical thinking, creative thinking, and problem solving are related conjunctly.

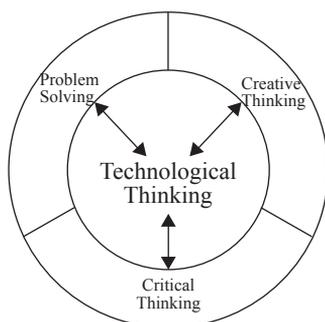


Figure 1. Relationship among Technological Thinking and Critical & Creative Thinking, Problem Solving

Thinking Disposition

Ennis(1994) defined thinking disposition as a tendency to do something given certain conditions. Facione, Sanchez & Facione(1994) defined thinking disposition as a constellation of attitudes, intellectual virtues, and habits of mind. Nam(2010) defined thinking disposition as a tendency of thinking to behavior corresponding to a given situation. Norris(1994) defined thinking disposition is not simply a desire or predilection to thinking critically. He said, "...individuals must either have formed habits to use certain abilities, or overtly think and chose to use the abilities they possess. A person with an ability to think critically under certain conditions will do it, only if so disposed" Ryle(1949) said "is not to be in a particular state, or to undergo a particular change; it is to be bound or liable to be in a particular state, or undergo a particular change, when a particular condition is realized" Salomon(1994) regarded thinking disposition as not just a "summary label for a cluster in interrelated and relatively stable behaviors" Tishman & Andrade(2009) said "Broadly defined, thinking dispositions are tendencies toward particular patterns of intellectual behavior"

Technological Thinking Disposition

After summarizing the concept of the technological thinking and thinking disposition as above Nam(2010) identified that the technological thinking disposition consists of 6 factors and 38 sub-elements. And he defined the technological thinking disposition as follows.

“Technological thinking disposition is a thinking tendency of Technological curiosity, Technological analysis, Technological problem identifying and solving, Technological creativity and expression, Technological manipulation, Technological planning and reflection, in the middle of the adapt and change to environment”

Method

Procedure

The procedure of this study is like Figure 2.

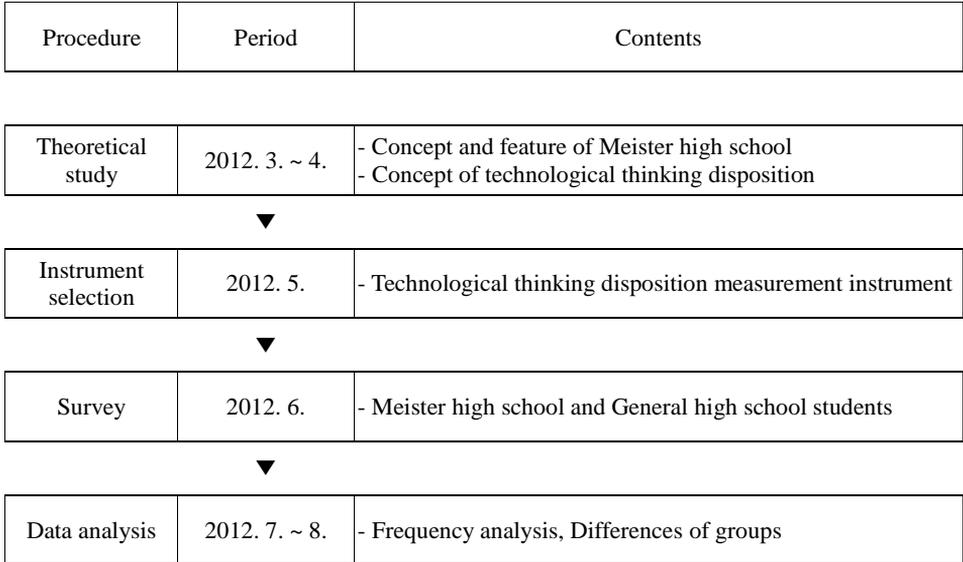


Figure 2. Procedure of the Study

Sample

The sample of this study is like Table 2.

Table 2
Characteristics of Participants

	Division	Meister Students(%)	General Students(%)	Total(%)
Sex	Male	371(28.3)	451(34.4)	822(62.7)
	Female	42(3.2)	448(34.1)	490(37.3)
Grade	7	179(13.6)	301(22.9)	480(36.6)
	8	156(11.9)	291(22.2)	447(34.1)
	9	78(5.9)	307(23.4)	385(29.3)
	Total	413(100.0)	899(100.0)	1,312(100.0)
	Row Percentage(%)	(31.5)	(68.5)	(100.0)

Table 2 shows that the total sample number of this study were 1,312. Among which there were 413 Meister high school students in 4 schools(371 male students and 42 female students), and 899 General high school students in 4 schools(451 male students and 448 female students). In order to sampling students were divided 4 regions as Seoul&Kyungki, Chungcheong, Honam, and Youngnam. The detail characteristics of samples are as follows.

Instrument

Technological thinking disposition measurement instrument(Nam, 2010) was employed to identify the Meister high school students' technological thinking disposition. This instrument consists of 6 factors and 38 items. The reliability of each factors showed from .774 to .884.

Table3
Instrument

Factor	Number of Item	Cronbach's α
Technological curiosity disposition	6	.832
Technological analysis disposition	4	.774
Technological problem identifying and solving disposition	8	.884
Technological creativity and expression disposition	7	.829
Technological manipulation disposition	7	.866
Technological planning and reflection disposition	6	.793

Data Collect and Analysis

The data that are needed in this study were collected with Meister and General high school's help. To collect the data surveys were delivered to each school and collected. Some data that has no sincerity was excluded from the analysis.

Quantitative techniques were used in data analysis. Descriptive statistics such as means, standards deviations, and percentages were used to present the survey data. Inferential techniques such as independents samples *t* tests were performed to investigate Meister high school students' technological thinking disposition.

Results

The Differences of Students’ Technological Thinking Disposition between Meister and General High School

Table4

Difference of Students’ Technological Thinking Disposition between Meister and General High School

Factor	N		M		SD		df		F	p (2-tailed)
	Meister	General	Meister	General	Meister	General	Inter group	Within group		
Factor 1	413	899	21.33	19.51	4.007	4.401	1	1,310	6.745***	.000
Factor 2	413	899	12.63	12.37	2.769	3.152	1	1,310	10.847	.152
Factor 3	413	899	25.88	24.09	5.174	6.433	1	1,310	35.760***	.000
Factor 4	413	899	21.33	20.43	4.714	4.976	1	1,310	7.726**	.002
Factor 5	413	899	25.14	23.21	4.997	5.383	1	1,310	4.538***	.000
Factor 6	413	899	19.58	18.30	4.141	4.288	1	1,310	1.609***	.000

p<.01, *p<.001

Table 4 shows that in most of the factors there are differences between Meister high school and General high school student’s technological thinking disposition but in Factor 2(technological analysis disposition) there is no statistically difference.

Factor 1(technological curiosity disposition), Factor 3(technological problem identifying and solving disposition), Factor 5(technological manipulation disposition), and Factor 6(technological planning and reflection disposition) shows the significant differences in significance level .001. Factor 4(technological creativity and expression disposition) also shows the significant differences in significance level .01. In addition the mean of Meister high school students’ technological thinking dispositions are the more high than General high school students.

The Differences of Male and Female Students’ Technological Thinking Disposition between Meister High School and General High School

Table 5 shows the differences of male students’ technological thinking disposition between Meister high school and General high school. In this table we can find the significant differences in Factor 1(technological curiosity disposition) and Factor 2(technological analysis disposition), but other factors does not show the significant differences.

Table5
Differences of Male Students' Technological Thinking Disposition between Meister and General High School

Factor	N		M		SD		df		F	p (2-tailed)
	Meister	General	Meister	General	Meister	General	Inter group	Within group		
Factor 1	371	451	21.45	20.62	3.783	4.118	1	820	2.043**	.003
Factor 2	371	451	12.74	13.39	2.718	2.964	1	820	2.407**	.001
Factor 3	371	451	26.03	26.10	4.907	6.060	1	820	24.049	.857
Factor 4	371	451	21.51	21.93	4.451	4.616	1	820	2.179	.185
Factor 5	371	451	25.43	24.82	4.703	4.974	1	820	.393	.072
Factor 6	371	451	19.76	19.36	3.970	4.155	1	820	.584	.162

**p<.01

Table6
Differences of Female Students' Technological Thinking Disposition between Meister and General High School

Factor	N		M		SD		df		F	p (2-tailed)
	Meister	General	Meister	General	Meister	General	Inter group	Within group		
Factor 1	42	448	20.31	18.39	5.563	4.497	1	488	2.396**	.009
Factor 2	42	448	11.67	11.33	3.050	2.997	1	488	.134	.494
Factor 3	42	448	24.57	22.06	7.051	6.163	1	488	.526*	.013
Factor 4	42	448	19.79	18.92	6.464	4.872	1	488	7.281*	.286
Factor 5	42	448	22.52	21.59	6.597	5.296	1	488	1.488	.284
Factor 6	42	448	17.97	17.22	5.210	4.153	1	488	2.786	.272

*p<.05, **p<.01

Table 6 shows the differences of female students' technological thinking disposition between Meister high school and General high school. Factor 1(technological curiosity disposition) shows the significant differences in significance level .001. Factor 3(technological problem identifying and solving disposition) and Factor 4(technological creativity and expression disposition) show the significant differences in significance level .05 but can't find statistically differences in Factor 2(technological analysis disposition), Factor 5(technological manipulation disposition), and Factor 6(technological planning and reflection disposition).

The Differences of Male and Female Students' Technological Thinking Disposition in Meister High School

Table 7 shows the differences of male and female students' technological thinking disposition in Meister high school. Factor 5(technological manipulation disposition) shows the significant differences in significance level .001. Factor 2(technological analysis disposition) and Factor 4(technological creativity and expression disposition) show the significant differences in significance level .01 but can't find statistically difference in Factor 1(technological curiosity disposition) and Factor 3(technological problem identifying and solving disposition).

Table7
Differences of Male and Female Students' Technological Thinking Disposition in Meister High School

Factor	N		M		SD		df		F	p (2-tailed)
	Male	Female	Male	Female	Male	Female	Inter group	Within group		
Factor 1	371	42	21.45	20.31	3.783	5.563	1	411	9.192	.081
Factor 2	371	42	12.74	11.67	2.718	3.050	1	411	.301*	.018
Factor 3	371	42	26.03	24.57	4.907	7.051	1	411	9.955	.083
Factor 4	371	42	21.51	19.79	4.451	6.464	1	411	15.019*	.025
Factor 5	371	42	25.43	22.52	4.703	6.597	1	411	5.212***	.000
Factor 6	371	42	19.76	17.97	3.970	5.210	1	411	4.646**	.008

* $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

Through result of this study we can identify Meister high school students' technological thinking disposition is the more high than General high school students in most of the factors.

In the differences of male students' technological thinking disposition between Meister and General high school there are significant differences in Factor 1(technological curiosity disposition) and Factor 2(technological analysis disposition), but other factors do not show the significant differences. In other words to carry out the effective education that suitable for Meister high school's male students, it is important to make the atmosphere that can maintain the curiosity and interest in the classroom. And in order to help students' technological analysis disposition, Meister high school's curriculum and textbooks should include the educational contents related with technological analysis disposition.

In the differences of female students' technological thinking disposition between Meister and General high school there are significant differences in Factor

1(technological curiosity disposition), Factor 3(technological problem identifying and solving disposition), and Factor 4(technological creativity and expression disposition). The difference of factor 1 is same as the male student's result. That is to say it is important to make and maintain curious atmosphere in the classroom. And it is also important to stimulate the students' technological problem identifying and solving disposition, and creativity and expression disposition for female students.

In the differences of male and female students' technological thinking disposition in Meister high school there are significant differences in Factor 5(technological manipulation disposition), Factor 6(technological planning and reflection disposition), Factor 2(technological analysis disposition), and Factor 4(technological creativity and expression disposition). It means that when we have a class different strategies are should be considered between male and female students, and it was concluded that differentiated education between male and female students are needed.

Conclusion and Recommendation

Conclusions obtained from this study are as follows:

First, through the results of this study it was concluded that Meister high school students' technological thinking disposition is the more high than General high school students. So when we make a curriculum and content of Meister high school we should consider the students' technological thinking disposition.

Second, there were differences of male and female students' technological thinking disposition in Meister high school. So when having actual educational activities we need to consider male and female students' technological thinking disposition and have to make differentiate educational plans between two genders. Recommendations on the basis of the results are as follows:

1. through this study Meister high school students' technological thinking dispositions were identified. The more careful analysis of these results will be needed to deduct the educational teaching method that suitable for Meister high school student.
2. in this study we identified the differences of students' technological thinking disposition between Meister and General high school, but to obtain more valuable resources additional studies such as investigation about other type's vocational high school students' technological thinking disposition are needed.

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The Influence of Learning Environment on Students' Learning Approaches

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ABSTRACT The purpose of this study was to determine the influence of learning environment on students' learning approaches at Malaysian Polytechnics. Learning environment plays an important role in the cognitive, effective and social domains of the students because it could improve students' learning outcomes. Learning approaches refer to the ways students deal with academic tasks that are related to learning outcomes. In this study, *Course Experience Questionnaire (CEQ)* and *Revised Two-Factor Study Process Questionnaire (RSPQ-2F)* were used to collect the research data. The data were analyzed using AMOS Version 18. Multiple regression was conducted to predict learning environment factors that influenced the level of students' learning approaches. Main result of the study shows that effective teaching is a major factor that influences the students' deep approach followed by the assessment, learning resources and clear objectives.

KEYWORDS learning environment, learning approaches, learning outcomes, polytechnics, Malaysia

Introduction

Even though the concept of learning environment has been studied by psychologists and educators for several decades, its effect on learning approaches is still embryonic. The concept of the learning environment has started in the 1930s, when Lewin (1936) examined the learning environment on human behavior. According to Lewin (1936), environment and individuals are determinants of human behavior. Lewin's ideas were further developed by Murray (1938) using the Model of Needs-Pressure to explain the

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relationship between individuals (I) and environment (E). Just as needs represent significant determinant of behavior in a person, the concept of pressure represents the effective or significant determinant of environment (Hall et al., 2000). Murray (1951) concluded that human behavior is influenced by individual needs and environmental demands. The Murray's model of learning environment was further refined by Walberg at the end of the 1960s and Fraser in the early 1980s. The studies of learning environment are still relevant because of its importance in helping to improve learning outcomes.

Moos (1974) studied the characteristics of individuals in a human environment and he had categorized them into three dimensions: relationship, personal development, and change of the system. Relationship dimension assessed the nature of the relationships, the level of involvement, support and assistance given by individuals in their psychosocial environment. Personal development dimension assessed individual progress toward personal growth and self-enhancement. The third dimension, change of a system, assessed the extent to which the environment is regulated and controlled. According to Fraser (1998), learning environment refers to the social, psychological and pedagogical contexts in which learning occurred that affect the student's attitude and achievement. There are many ways to assess the psychosocial environment but according to Kuert (1979), self-reported questionnaire is the most common tool used to assess the psychosocial environment. Using students' perception to evaluate the learning environment is essential because the students are individuals who are directly involved in the learning environment. The learning environment could reflect the quality of teaching and learning in which the context occurs (Biggs, 1999; Ramsden 1991). Ramsden (1991) and McInnis et al. (2001) perceived learning environment could be categorized into:

Teaching

Teaching is a process of delivering knowledge, cultivating new confidence, changing attitudes or behavior of students. During the process of teaching, teachers need to make adaptations based on the ability of students in a class. A teacher should use various suitable methods so that effective learning process can take place. According to Sharifah Alwiah Alsagoff (1983), an effective teacher should master various methods and techniques that are appropriate for different types of students. Advanced planning and preparing for a class is a precursor for successful teaching. An effective teacher must possess adequate content knowledge, pedagogical skill and positive attitudes. An experienced teacher will plan systematically his or her teaching that will directly benefit the students in the future (Baharin, Othman, Syed & Haliza, 2007). Furthermore, a teacher acts as a role model in guiding and educating students to demonstrate positive attitudes toward their academic achievements. Thus, a teacher is a critical factor that may contribute to excellent academic achievements of students (Widad Othman, 1998).

Learning Resources

The facilities available in an institution of learning play an important role in meeting the learning needs of the students. According to Chan (1996), a classroom with adequate learning resources is more likely to succeed than classes with poor facilities. Physical conditions of the class such as lighting, temperature, air quality and resources should be of concern prior to beginning of the teaching and learning process. Conducive environment will enhance students' interest in learning and they are more likely to focus on the lesson delivered by the teacher. The use of appropriate teaching aids could enhance teaching effectiveness (Dwyer, Ringstaff & Sandholtz, 1991). Norlia et al. (2006) investigated the relationship between environment, element of input and output of students found through multiple regression analysis that environmental factors such as learning resources is a significant contribution. A study conducted by Kamaruddin Tahir (2010) in assessing the level of community college students' generic skills revealed that the learning facility is a significant contribution to the students' generic skills development.

Learning Workload

Learning workload is defined as the responsibilities of academic work to be undertaken by a student in a learning process. Workload which is too heavy is detrimental to the students in their learning process (Baharin, Othman, Syed & Haliza, 2007). Studies conducted by Kember and Leung (1998) found that students' workload do affect their achievement levels. Students, who are burdened with heavy duties, did not have time to apply their thinking skills in completing their tasks.

Assessment

Assessment is a system that includes activities to evaluate the strengths and weaknesses of students, teaching and learning activities in order to take appropriate decision such as planning of effective teaching activities (Mok, 2009). Assessment procedures include the aspects of testing, measurement and interpretation. An assessment is conducted to see whether the teaching and learning activities have achieved the planned objectives. Assessment given to students should be able to appraise the overall capability and not just to focus on the facts alone. Assessment should be conducted in a formative and summative manner. Among the types of assessment used were quizzes, assignments, tests, examinations, presentations, projects or research.

Learning Community

Learning community is a community that involves the students, peer interaction and the teachers in the learning environment. A study conducted by Kamaruddin Tahir (2010) in assessing the level of community college students' generic skills found that peer interaction in a learning community contribute significantly to the level of generic skills acquisition among college community students in Malaysia. The main finding

shows that the interaction among peers is the highest contributor followed by interaction with the instructors who teach. The study conducted by Norlia et al. (2006) also obtained similar result in evaluating the relationship between environment and element of input and output of students. Multiple regression analysis revealed that environmental factors such as the quality of academic interaction are a major contribution.

Program Goals/Objectives

According to Wheeler's Curriculum Development Process Model (cited in Mok, 2009), the formulation of curriculum should involve the goals and objectives of teaching and learning intended. Clarity of the objectives presented to students is assumed to facilitate students' understanding of content and skills needed to master the learning and produce the expected outcomes of the curriculum. Clarity of goals and learning objectives will influence the students' mastery of the content.

Barrie and Prosser (2003) states that learning is a function of current and past experiences. Thus, to enhance the learning outcomes, learning institution should be concerned with the context and experiences of the students. The aim of this study was determine whether the students' personal factors (ability, motivation, prior knowledge, gender, race) and the learning contexts (program goals, evaluation, task load, good teaching, teaching approach) affect the students' learning approaches. Aspects of learning environment studied by the previous researchers such as workload (Karagiannopoulou & Christodoulides, 2005; Kember & Leung, 1998, Lizzio et al., 2002;), assessment (Gijbels & Dochy, 2006; Karagiannopoulou & Christodoulides, 2005; Kim, 2002), teaching approach (Cabrera, Colbeck & Terenzini, 2001; Karagiannopoulou & Christodoulides, 2005), learning resources and learning community (McInnis, Griffin, James & Coates, 2001; Smith & Bath, 2006). Table 1 shows the aspects of learning environment studied by the previous researchers.

Table 1
Learning Environment Factors

	Factor	Researchers
1	Assessment	Ramsden (1991); Kember & Leung (2005); Gijbels & Dochy (2006)
2	Work Load	Ramsden (1991); Kember & Leung (1998); Biggs (1999); Karagiannopoulou & Christodoulides (2005)
3	Learning Community	Fraser (1998); Smith & Bath (2006); Norlia (2006); Kamaruddin (2010)
4	Learning Resources	Norlia (2006); Smith & Bath (2006); Kamaruddin (2010)
5	Teaching Approach	Ramsden (1991); Biggs (1999); Kember & Leung (2005)
6	Clear Objectives	Ramsden (1991); Biggs (1999); Lizzio et al. (2002); Kember & Leung (2005)

A series of important studies conducted by Marton and Saljo (1976) and then through their highly influential book, *The Experience of Learning*, they examined surface and deep approaches to learning. Marton and Saljo's study which took place at the University of Gothenburg, Sweden in the 1970's where they asked students to read an article written by a professor of education on some proposed university reforms in Sweden. They told students that they would ask them some questions about the text once they finished reading it. Marton and Saljo met with the students and asked them open-ended questions to assess their approach to reading and their understanding of the text. Marton and Saljo (1976) reported that while reading the text, some students simply identified some isolated facts mentioned in the text, which they believed the researchers would ask them during the interview, and then memorized those facts. These students could not make any connections between these facts and failed to see any connection to their realities. Another group of students attempted to understand what the author was saying, focused on the underlying meaning of the text, and sought to integrate the different facts mentioned in the text. The first group of students focused on the surface level of the text while the second one adopted a deeper approach. These findings are consistent with earlier work of Ausubel in 1961 where he differentiated between meaningful learning and rote learning. Marton and Saljo (1976) identified two different levels of processing – deep and surface learning approaches.

Methodology

Studies on the learning environment have evolved from 1960, thus, there are several instruments that have been developed by researchers who studied the field. Among the instruments that were developed by researchers in the past include the *Course Experiences Questionnaire* (Ramsden, 1991), (McInnis et al., 2001), *WIHIC* (Fraser, 1998), *Classroom Environment Scale CES* (Moos 1974), *My Class Inventory* (Fraser & Fisher, 1982). *Course Experiences Questionnaire CEQ* (Ramsden 1991; McInnis, James & Coates 2001) and *What is Happening in Classroom WIHIC* (Fraser 1998; Dorman 2003) were developed to examine students' perceptions on learning environment at higher education institutions. According to Ramsden (1991), CEQ is a valid instrument developed based on the theories of the relationship between students' experiences in teaching and learning outcomes. But none of the instruments were tested in Malaysia. Therefore, this study focused on determining the appropriate instrument based on the learning environments in Malaysia.

The present survey research was conducted at Malaysian Polytechnics involving 527 final-year engineering students. In order to collect the research data, a questionnaire was developed based on CEQ and WIHIC. The questionnaire contained 3 parts Part A, B, and C. Part A consisted of items related to student demographics. Part B of the questionnaire is about learning environment consisting of six constructs adapted from Moos (1974), Ramsden (1991), Fraser (1998), and McInnis et al. (2001). Part C contained 20 items of the learning approaches adopted from the Revised Two-Factor

Study Process Questionnaire [R-SPQ-2F] (Biggs *et al.*, 2001). This part was designed to measure the conventional approach to learning by individuals could fulfill the task of learning in a learning environment. Table 2 shows the learning Environment factors based on the Moos' scheme.

Table 2
Learning Environment Factors based on the Moos Scheme

Factors	Description	Moos Scheme
Teaching Approaches	Good teaching – relates to the quality of the teaching approach	Relationship
Clear Objectives	Clear objectives– show whether the students were given clarification about how and what knowledge and skills that are being developed in their program	System Maintenance and Change
Assessment	Assessment – shows the extent of quantity and quality of students' assessment's role	Personal Development
Work Load	Work Load – reflects the burden and quantity of assignments in students' learning	Personal Development
Learning Resources	Learning Resources – shows the learning resources provided for the students.	System Maintenance and Change
Learning Community - Peer Interaction - Cooperation - Equality	Learning Community – shows the influence of peers on the learning	Relationship and Personal Development

Reliability of the Instrument

The questionnaire was validated by measuring the internal consistency of the items. Table 3 shows the values of the reliability index (Cronbach Alpha). The values of Cronbach Alpha for all the sub-constructs for the questionnaire in this study are between 0.77 and 0.86. According to Babbie (1992), Cronbach Alpha values are classified based on the classification in which the reliability index of 0.90-1.00 is very high, 0.70-0.89 is high, 0.30-0.69 is moderate, and 0.00 to 0.30 is low. The result shows that the Cronbach Alpha for this instrument is relatively high. According to Sekaran (2003), Cronbach Alpha value must be greater than 0.5. While Mohd Najib (1999), suggests a minimum value equal to 0.6. We can conclude that this instrument possesses acceptable reliability since Cronbach Alpha value for this questionnaire is more than 0.5 (Table 3).

Table 3

Values of Cronbach Alpha for the Sub-constructs in Learning Environment

Sub-constructs	Number of Items	Number of Items Excluded	Cronbach Alpha
Assessment	5		0.77
Good Teaching Approach	7		0.79
Work Load	5		0.86
Teaching Objectives	5	1	0.79
Learning Community	5		0.86
Learning Resources	6		0.78

Results and Discussion

Factor analysis was performed on the six sub-constructs, ie., instructional objectives (O), assessment (P), work load (T), learning communities (KP), learning approaches (PP), and learning resources (SP) using the varimax rotation (Table 4). Results show that the six factors with Eigen values above 1.0. The value of Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.868 which is adequate for inter-correlation while Barlett Test was significant (Chi Square = 5962.485, $p < 0.05$). The anti-image correlation matrix by the Measure of Sampling Adequacy (MSA) was more than 0.5. Items O2, PP6, PP7, P1, SP3 and SP4 were dropped based on the criteria by Hair et al. (2006), where the items didn't reach the 0.50 cut-off point. Total variance explained for this loading was 61.5%. This value is sufficient as according to Sekaran (2003), the total variance explained must be more than 50%.

Table 4
Factor Analysis

Item	Objective	Assess-ment	Work Load	Learning Community	Learning Approach	Learning Resources	Extrac-tion
01	0.673						0.540
03	0.829						0.668
04	0.799						0.655
05	0.757						0.610
P2		0.735					0.598
P3		0.785					0.685
P4		0.772					0.609
P5		0.714					0.608
T1			0.717				0.517
T2			0.837				0.720
T3			0.796				0.684
T4			0.815				0.676
T5			0.781				0.652
KP1				0.800			0.688
KP2				0.751			0.672
KP3				0.775			0.651
KP4				0.846			0.726
KP5				0.701			0.591
KP6				0.800			0.557
PP1					0.751		0.485
PP2					0.645		0.589
PP3					0.760		0.544
PP4					0.690		0.516
PP5					0.577		0.430
SP1						0.569	0.568
SP2						0.715	0.681
SP5						0.804	0.689
SP6						0.810	0.540
Total variances explained							61.51%

Table 5 shows the reliability of the items in the two-domain approach to learning. The Cronbach Alpha for items measuring the deep approach is 0.73 and the surface approach is 0.85, respectively. Factor analysis (Table 6) was performed using varimax rotation to confirm the two constructs studying the deep approach (DS) and surface approach (SS). Result of the analysis has shown that two factors have Eigen values exceeding 1.0. The value of Kaiser-Meyer-Olkin Measure of Sampling Adequacy was

0.85 which is adequate for intercorrelation while Barlett test was significant (Chi Square = 1577.6, $p < 0.05$). The Measure of Sampling Adequacy (MSA) for anti-image correlation matrix was more than the value of 0.5. Item DS1, DS2, DS3, DS4, DS10, SS1, SS7, SS9 and SS10 were less than 0.5 so they were dropped. Total variance explained for this loading was 53.16 %.

Table 5
Cronbach Alpha for Learning Approaches Scales

Variables	Item	Cronbach Alpha in this study	Cronbach Alpha published in 2001 (Biggs et al.)
Surface	10	0.85	0.64
Deep	10	0.73	0.73

Table 6
Factor Analysis

Item	Deep	Surface	Extraction
DS5		0.600	0.370
DS6		0.589	0.389
DS7		0.700	0.490
DS8		0.653	0.426
DS9		0.706	0.501
SS2	0.771		0.603
SS3	0.826		0.688
SS4	0.828		0.690
SS5	0.786		0.620
SS6	0.724		0.542
SS8	0.718		0.529
Total Variances Explained %	33.42	19.74	53.16
Eigen values	3.9	1.9	5.8

Table 7 shows the correlation between criterion variable (DS) and predictor variable of good teaching was 0.360 and the correlation between criterion variable and a combination of good teaching and assessment is 0.418. While the correlation of criterion variable (DS) and linear combinations of three predictor variables of learning resources, assessment, good teaching is 0.452. While the correlation of criterion variable and linear combinations of the four predictor variables of learning resources, assessment, good teaching and a clear objective is 0.469. The R^2 of 0.130 shows that 13% change in the criterion variable (DS) is due to change in the good teaching. The combination of good teaching and assessment contribute 17.5%. The combination of good teaching, assessment, learning resources accounted for 20.4%. The linear combination of the four predictor variables accounted for 22% of the variance in the criterion variable (DS).

Table 7
Regression Model

Model	R	R ²	Adjusted R Square	Std. Error of the Estimate
1	0.360 ^a	0.130	0.128	0.424
2	0.418 ^b	0.175	0.172	0.413
3	0.452 ^c	0.204	0.200	0.406
4	0.469 ^d	0.220	0.214	0.402

a=good teaching
 b=good teaching, assessment
 c=good teaching, assessment, learning resources
 d=good teaching, assessment, learning resources, clear objectives

Results of $F(4, 510) = 35,884$ ($p < .05$) indicates that the relationship between the four predictor variables and the criterion variable is significant. This value shows the 22% contribution of the four constructs (teaching, assessment, learning resources, clear objectives) of the criterion variable (DS) is significant. This situation clearly shows that good teaching is a major factor affecting the increase in students' deep approach followed by the assessment, learning resources and clear objectives. Table 8 shows the regression coefficient b for the four predictor variables in linear combinations. The value of regression coefficient β represents the standard for four predictor variables in the form of linear combinations. While the value of t indicates significant results at $p < .05$. Thus, the multiple linear regression is:

$$Z_{DS} = (0.186) Z_{teaching} + (0.188) Z_{assessment} + (0.157) Z_{objective} + (0.143) Z_{resources}$$

Table 8
Multiple Regression Analysis (Stepwise) for Predicting Deep Learning Approach

Model	b	Beta (β)	t	Sig.
(Constant)	1.400		6.944	.000
Teaching	0.179	0.186	4.103	.000
Assessment	0.173	0.188	4.339	.000
Learning Resources	0.101	0.157	3.722	.000
Clear Objectives	0.144	0.143	3.178	.002

Criterion Variable: Deep Learning Approach

Table 9 shows the correlation between criterion variable (SS) (Surface Approach) and predictor variable workload is 0.340 and the correlation between criterion variables and a combination of workload and assessment is 0.447. The correlation between criterion variable and linear combinations of the three predictor variables workload, learning community and assessment is 0.468 while the correlation of criterion variable (SS) and linear combinations of the four predictor variables workload, assessments, learning resources, learning community is 0.485. The R² of 0.115 shows that 11.5% change in the criterion variable is due to changes in workload. Combination of workload and assessment contributed 20%. The combination of work load, assessment, learning community contributes 21.9%. The linear combination of the four predictor variables accounted for 23.5% of variance changed in the criterion variable (SS).

Table 9
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.340 ^a	0.115	0.114	0.71809	
2	0.447 ^b	0.200	0.197	0.68353	
3	0.468 ^c	0.219	0.215	0.67589	
4	0.485 ^d	0.235	0.229	0.66950	1.864

a=workload
 b=workload, assessment
 c=workload, assessment, learning community
 d=workload, assessment, learning community, learning resources

Results of $F(4, 510) = 39,272$ ($p < .05$) indicates that the relationship among the four predictor variables and the criterion variable is significant. The value shows the 23.5% variance is attributed to the four sub-constructs (work load, assessment, learning communities, learning resources). This situation clearly shows that the work load is a major factor influencing the increase in the surface approach followed by the assessment, learning communities and learning resources. Table 10 shows the regression coefficient b for the four predictor variables in linear combinations. The value of regression coefficient β represents the standard for four predictor variables in the form of linear combinations. While the value of t indicates significant results ($p < .05$), thus, the multiple linear regression is:

$$Z_{SS} = (0.330) Z_{workload} + (-0.242) Z_{assessment} + (-0.192) Z_{communities} + (0.136) Z_{resources}$$

Table 10

Multiple Regression Analysis (Stepwise) for Predicting Surface Learning Approach

Model	b	Beta (β)	t	Sig.
(Constant)	3.115		9.175	0.000
Workload	0.349	0.330	8.398	0.000
Assessment	-0.373	-0.242	-5.861	0.000
Learning communities	-0.261	-0.192	-4.403	0.000
Learning resources	0.147	0.136	3.285	0.001

Criterion Variable: Surface Learning Approach

Conclusion

Result of this study clearly shows that good teaching is a major factor affecting the increase in students' deep approach followed by the assessment, learning resources and clear objectives. The study also shows that the workload is a major factor influencing the increase in the surface approach followed by the assessment, learning communities and learning resources. A student who adopts a deep approach is interested in academic work and enjoys the process of doing and finding the meanings in their academic work. However, a student who adopts surface approach, sees the work as a condition to be fulfilled; views part or aspect of work as something separate and not connected to each other or with other tasks; takes concerned about the time taken to do the task; avoids other meanings carried by the task; and tries to produce work that only have surface meaning.

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Factors Influencing the Career Choice of Business and Finance Students from the Vocational and Technical Education in Brunei Darussalam

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ABSTRACT Most career choice research has concentrated on predicting career choice behaviors based on personality traits or demographic variables but relatively little research has examined the factors that influence career choice (Agarwala, 2008). This study seeks to explore the influence of a range of factors on the career choice of business and finance students of the vocational and technical institution in Brunei. In addition, the study tried to address the relationship of the cultural values of individualism-collectivism as well as the importance of different individuals in the family in influencing the choice of a career. Participants consisted of 96 students selected randomly from one of the vocational and technical institutions who were starting their first year full-time National Diploma and Pre-national Diploma Business and Finance programmes. A self-administered questionnaire adapted from previous career researches conducted on: factors influencing career choice (Özbilgin et al., 2004); relationships influencing career choice (Özbilgin, 2005) and Individualism-Collectivism (Triandis and Gelfand, 1998) were used to gather data. The Cronbach alpha coefficients for the three scales were found to be 0.886, 0.761 and 0.845 respectively. The findings reviewed that a) ‘love for the career’ was the most important factors b) “parents” was the most significant individual influencing the career choice and c) “collectivism” was the predominant cultural values of Bruneian VTE students. The findings will have direct implications for career guidance for students and administrators of vocational and technical institutions alike.

KEY WORDS career choice, career guidance, business and finance related VTE programmes, Brunei Darussalam

Introduction

Career choice as a subject has attracted the attention of scholars and practitioners from a range of disciplines as well as the public, due to its multifaceted nature. Since career is a result of the interplay between individuals within organizational and social

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structure, it yields well to analysis from diverse perspectives ranging from occupational psychology to organizational sociology (Özbilgin, Kusku and Erdormus, 2004). By reviewing the career choice literature one can notice that the individual is central to all career choice theories. Yet it has been dealt with the notion of individual differently. In the traditional bureaucratic literature of career development, careers are conceptualized as taking place within organisational structures; in the sense that success is measured externally or objectively in terms of the positions, rewards and ranks that an individual occupy within the hierarchy of one or two firms (Kanter, 1989; Baruch, 2004).

As a response to the recent economic, social and technological changes, new non-traditional career paths have emerged such as; the boundaryless career (Arthur & Rousseau, 1996), the intelligent career (DeFillippi & Arthur, 1994 & 1996), the protean career (Hall, 2002), where the nature of career is dynamic, transitional in multiple organisations or occupations. The measurement of success in these new career paths are subjective (internal), i.e., the feeling of pride and personal satisfaction that comes from achieving one's most significant goals in life such as family happiness, inner peace, rather than the objective success; position, salary and status (Briscoe & Hall, 2002; Hall, 2004). Recent researchers on career choice highlighted personal and cultural values, family background, and career expectations, as some of the important factors influencing career decision. Studies have also been conducted in different cultural contexts to determine the range of factors that influenced students in making career choices (Özbilgin et al., 2005).

The most common framework used when looking into factors influencing career choice is derived from studies by Carpenter and Foster (1977) and Beyon et al. (1988). The three factors classified in their studies are 1) intrinsic (interest in the job, personally satisfying work); 2) extrinsic (availability of jobs, well-paying occupations); and 3) and interpersonal (influence of parents and significant others).

Most career choice research has concentrated on predicting career choice behaviors based on personality traits or demographic variables (Özbilgin et al., 2005). Relatively little research has examined the factors that influence career choice (Agarwala, 2008). Large amount of the extant studies on career choice have been conducted on occupational groups such as accountants and health care professionals (Sugahara et al., 2008; Gedde et al., 2005; Al-Nuaimi et al., 2008; Danczyk et al., 2011). Few studies have addressed the career choice especially at VTE students' enrolled in marketing and finance related programmes and the factors influencing this choice.

Relationships influencing career choice is also another important factor that has not been well understood. Although it constitutes an important dimension of human functioning on how relationships and careers are intertwined, it has generated very little attention in the past. The role of relationship in career choices has much been overlooked as most research effort has been focusing on how relationships and networks are conducive to career mobility and advancement (Agarwala, 2008). There is definitely a need to explore the relative importance and influence of different relationships in making career choices among VTE students in Brunei.

Contemporary researchers call for more research in examining the influence of external influences, in particular the cultural influences on career decision-making process to balance the knowledge base (Duffy & Dik, 2009; Sullivan & Baruch, 2009; Brown, 2002; Wong & Liu, 2010). Studies have focused on the cultural dimension of individualism-collectivism as an important determinant that influences career “choice” of students from countries that vary along the individualism-collectivism dimension. These studies have examined cultural variations in factors influencing career choice (Auyeung and Sands, 1997). The individualism-collectivism dimension, first measured empirically by Hofstede (1980), describes how individuals relate to others and to society, and represents the extent to which they are emotionally and cognitively attached to a particular network of individuals. “Individualism” refers to the tendency of people to consider their own interests only, to view themselves as “independent” of organizations, and to place a higher value on self-reliance and individual action. “Collectivism” refers to the inclination of people to view themselves as “interdependent” and as part of a larger group, and to protect the interests of group members. Therefore, preferences for social influences in making career choices may also differ in individualistic versus collectivistic cultures.

According to Hofstede’s empirical index for the dimension, Western countries (the USA, the UK, Australia) cluster toward the individualist end while Asian nations (such as Japan, Taiwan and India) cluster toward the collectivist end. It may be inferred, therefore, that variability in individualism-collectivism is likely to exist in the sample of Bruneian VTE students, and this variability may have an effect on what factors and relationships are likely to influence these students in their choice of career.

As a step to support the nation’s initiatives to diversify its economy from the over reliance on the export of oil and gas, the Department of Technical Education over the past decade has been offering business and finance related vocational and technical programmes through its vocational and technical institutions (VTI) to provide the human resources needed for the diversification process. Over the years, there has been an increase in demand for business and finance related VTE programmes from school leavers in Brunei Darussalam. The increase has been reflected by the increase in the number of school leavers applying to be enrolled into these programmes. However, this surge in students choosing business and finance programmes as their preferred choice has not been well studied and understood. With the absence of research especially in the local VTE context, it is important to provide an insight into the reasons as to why school leavers are choosing business and finance as their preferred career choice.

Purpose of the Study

This study seeks to investigate the influence of a range of factors on the career choice of the business and finance students in one of the Vocational and Technical Institutions in Brunei and the types of relationships influencing career choice. The research questions were:

- What are the factors influencing VTE marketing and finance students' career choices?
- How much influence does other individuals such as family members have on VTE students' career choices?
- What are the social influences from the individualism-collectivism dimensions on VTE students in making career choices?

Methodology

The data for this quantitative research were collected through a questionnaire survey. The questionnaire was adapted from instrument based on previous career researches conducted on: factors influencing career choice (Özbilgin et al., 2004); relationships influencing career choice (Özbilgin, 2005) and Individualism-Collectivism (Triandis and Gelfand, 1998). The items were scored on a 7-point Likert scale of 1 (Strongly Disagree) to 7 (Strongly Agree). There were six sections in the questionnaires administered on the students. Section one, two and three were designed to obtain data regarding personal details, course details and career decisions respectively. Section four consisted of a list of 18 items regarding the factors influencing career choice. Section five and six consisted of a list of 10 items regarding people influencing career choice and 16 items regarding individualism-collectivism values respectively. The instrument was checked by two experience researchers to determine the face validity.

A total of 96 questionnaires were distributed randomly to the 2012 new intake of Pre-National Diploma and Year 1 National Diploma in Business and Finance students from one of the vocational and technical institutions offering business and finance courses. Out of the 96 samples, the gender distributed were such that male, $n = 38$ (39.6% of the population) and female, $n = 58$ (60.4%) of the population. The data was then coded and analysed quantitatively using the statistical software for social sciences, IBM SPSS Statistic 20.

Results and Discussion

The reliability indices of the scales were calculated. Since the questionnaire was designed to measure different scales, separate reliability coefficients were calculated for each scale, mainly: factors influencing career choice scale items, relationships influencing career choice scale items and individualism-collectivism scale items. The Cronbach alpha coefficients for the three scales were found to be 0.886, 0.761 and 0.845 respectively (Table 1). The Cronbach alpha reliability is high. Studies have shown that a reliability of more than 0.7 is considered to be as reliable (George and Mallery, 2003).

Table 1
Alpha Reliability Coefficients of Factors Influencing Career Choice, Career Expectations, Relationships Influencing Career Choice and Individualism-Collectivism Scales

Scale	No. of items	Reliability
Factors influencing career choice	18	0.886
Relationships influencing career choice	10	0.761
Individualism-Collectivism values	16	0.845

Factors Influencing Career Choice

Of the 18 items in this category (Table 2), ‘My love of this career’ is ranked first, as the most important factors influencing career choice. The probable cause of this might be that the students are already keen on this area thus prompting them to choose the business and finance programme. ‘I have a free choice in making my own career decisions’ is ranked second among the rest of the factors influencing career choices. The mean scores suggest that the students believe that they had free choice in making their career decision. Choice with its many interlocking interpretations at the level of national politics, institutional processes and individual activity is a multi-layered and ephemeral concept. The belief of free choice of career reflects a purely agentic understanding of career choice, which fails to recognise any extrinsic factors that impinge upon it (Ozgilgin et al., 2004). This shows that individuals and the markets function best when they are free from external intervention. The dominance of the belief in free choices was also reflected in the study conducted on Turkey, Israel and Britain (Ozgilgin et al., 2004). “Own education and training” ranked join 5th which reflects a firm belief by the students in the significance of their education and training in their career choices. In other words, students perceive their education as one of the significant indicator of their prospective career choices.

Equally of high importance is ‘Success stories of acquaintances, friends, family and others’ which is ranked third. This is a very significant finding for career guidance with major implication when planning career related activities for students. It is highly recommended to invite professionals to share their experiences and their career journey during such events.

Individuals are “pushed” into certain careers because of the absence of alternative choices or they are “pulled” into their careers as they are personally attracted to some career choices. From this study, it seems like “Financial rewards in this career” (ranked fourth) and “Training and education opportunities in own career of choice” (ranked fifth) are seen as two major pull factors influencing students choice. The result is as expected as the rewards in the business and finance sectors has been doing well as compared to most of the traditional sectors in Brunei. Vertical progression in Business and Finance studies are increasing available at both public and private institutions. It is also very apparent that “Lack of access to other career options” has the lowest rank among all the factors influencing career choices. This means that students are not

“pushed” into choosing business and finance because of the lack of options but instead of their love to the career (ranked first)

Table 2
The Ranking of Factors Influencing Career Choices

Items	Mean	SD	Rank
My love of this career	5.83	1.07	1
I have a free choice in making my own career decisions	5.64	1.33	2
Success stories of acquaintances, friends, family and others	5.60	1.12	3
Financial rewards in this career	5.42	1.31	4
My education and training	5.35	1.17	5
Training and education opportunities in own career of choice	5.35	1.15	5
My career choices are influenced by my own career background	5.30	1.37	6
Chance, luck or circumstances	5.22	1.38	7
My skills, competences and abilities	5.14	1.04	8
Ease of access to own career of choice	5.13	1.27	9
Promotion opportunities with own career of choice	5.08	1.26	10
Development opportunities with own career of choice	5.04	1.26	11
Flexibility associated with own career of choice	4.90	1.13	12
Quality of life associated to own career of choice	4.81	1.23	13
My knowledge of the labour/ career market	4.78	1.16	14
My own financial and economic condition	4.72	1.29	15
Autonomy associated with own career of choice	4.60	1.16	16
Lack of access to other career options	3.66	1.58	17

The Influence of Relationships on Career Choice

Of the 10 items under this category (Table 3), ‘mother’ has shown to have the most influence the upon the career choice of the VTE business and finance students. This was followed closely with ‘father’ in second place. This shows that parents play an influential role on career choice of Bruneian students. This result is in contrast with Indian students whereby ‘father’ is the most influential figure in terms of career choices as compared to ‘mother’ in the Indian society (Agarwala, 2008).

In the Bruneian context, ‘teacher/ mentor’ is ranked third most influential people for influencing career choice of students. This could be due to the fact that after parents,

teachers are whom the students spend most of the day with thus teacher influence should not be taken of lightly. This show how important the roles of teachers are in our society and provide a very strong case to better equip them with proper career guidance and counseling skills.

Work colleagues and manager/ boss are the last two factors ranked as people influencing choice of careers. The main cause of this would probably because they might be rendered as irrelevant factors since most of the students have not worked before.

Table 3
The Ranking of Relationships Influencing Career Choice

Items	Mean	SD	Rank
Mother	5.94	1.35	1
Father	5.73	1.60	2
Teacher/ mentor	5.65	1.44	3
Siblings	5.50	1.39	4
Friend(s)	5.46	1.30	5
Fellow students (secondary schools)	4.81	1.54	6
Other relatives	4.81	1.64	6
Spouse/ partner	4.70	2.07	7
Work colleagues	4.47	1.95	8
Manager/ boss	3.97	2.02	9

Individualism-Collectivism on Career Choice

Out of the 16 items (Table 4), ‘Family members should stick together, no matter what sacrifices are required’ (ranked first), ‘It is my duty to take care of my family, even when I have to sacrifice what I want’ (ranked second), ‘It is important to me that I respect the decisions made by my group’ (ranked third) and ‘Parents and children must stay together as much as possible’ (ranked fourth) made up the first four ranking of individualism and collectivism values of the Bruneian students. As can be seen, the four items are aligned towards collectivist cultures. This come not as a surprise for Bruneian students as studies have shown that in general, the individualist societies are those from Europe, North America and Australasia while the collectivist cultures are found in Asia, Africa & South America (Baines, 2009). Ranked fourteen and fifteen places respectively are ‘I often do “my own thing”’ and ‘I rely on myself most of the time; I rarely rely on others’. This actually reflects the typical Bruneian students whereby they are less independent and are reliant on the school or teachers support.

Table 4
The Ranking of Individualism-Collectivism Values

Items	Mean	SD	Rank
Family members should stick together, no matter what sacrifices are required	6.29	1.03	1
It is my duty to take care of my family, even when I have to sacrifice what I want	6.22	1.07	2
It is important to me that I respect the decisions made by my group	6.07	1.12	3
Parents and children must stay together as much as possible	6.01	1.11	4
I feel good when I cooperate with others	5.89	1.05	5
It is important that I do my job better than others	5.55	1.43	6
My personal identity, independent of others is very important to me	5.53	1.21	7
Competition is the law of nature	5.48	1.49	8
The well-being of my fellow students is important to me	5.42	1.14	9
I would rather depend on myself than others	5.42	1.55	9
To me, pleasure is spending time with other people	5.29	1.26	10
If a fellow student gets a prize, I would feel proud	5.19	1.49	11
Winning is everything	5.09	1.68	12
When another person does better than I do, I get tense and aroused	4.97	1.69	13
I often do “my own thing”	4.95	1.42	14
I rely on myself most of the time; I rarely rely on others	4.69	1.63	15

Implications and Recommendations

The study managed to give an insight into the influence of a range of factors on the career choice of the business and finance students in one of the Vocational and Technical Institutions in Brunei Darussalam. The ‘love for the career’ is ranked highest among the rest of the factors influencing the Bruneian VTE students. The second factor is ‘free choice in making my own career decisions’ followed by ‘success stories of acquaintances, friends, family and others’ coming in third. ‘My education and training’ comes join fifth with ‘financial rewards in this career’ and ‘training and education opportunities in own career of choice’ came sixth. This findings has major implications when conducting career guidance for example, exposing the students to the different field in business and finance sector by having professionals from the industries to share their experiences and success stories. Having a clear pathway on career development in business and finance as well as further education progression route will also help students better make career decision and matching their qualification with different job

requirements. Emphasis can also be placed on the physical rewards of the industries and well as the training opportunities available as students value the two factors highly when making career choices.

Based on the analysis on relationship influencing career choices, it is found that individuals that have the most influence to the career choice of business and finance students are parents and teachers. This has major implication on the setting policies on career guidance such as inviting parents for career talks as they possess a great influence on their child career choices. The idea is to educate and disseminate accurate career information so that correct judgment and decision can be made based on reliable information. As teacher is the next most influential figures after parents, there is also a need to embed an element of career guidance into initial teachers' preparation programmes for new teachers as well as teachers' development programmes for existing teachers. There is a need to accept the fact that VTE teachers will directly or indirectly be influencing the career choice of the students thus providing the right type of support and guidance through training and upgrading is very important to ensure things are done professionally.

As Bruneian students are geared towards collectivism values heavily in making career choice, there is a need to further study and understand this strong social influence on the students and any negative impacts it assert on the students.

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The Relationship between Career Self-Concept and Occupational Awareness of Vocational High School Students in Taiwan

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ABSTRACT The purpose of this study was to explore the correlation of career self-concept and occupational awareness of vocational high school students. The “career self-concept and occupational awareness of vocational high school students” questionnaires were used as the research instrument. There were 955 students included as the samples of this study. Except for the descriptive statistics, the statistical analysis was done through one-way ANOVA, Pearson product-moment correlation coefficient, multiple regression, and canonical correlation. The results were: (1) Vocational high school students’ career self-concept and occupational awareness were related. (2) Various background students perceived significantly different career self-cognition and occupational awareness. Female students showed a higher career self-concept level than the males. Private school students had a higher vocational awareness than those in public schools. The junior students of vocational high school had a higher level than the freshmen in terms of personality quality and work attitude. Vocational high school students majoring in Hospitality Management held a higher level than students in other programs in career interest and vocational awareness. Vocational high school students whose families were in a higher SES had higher vocational awareness than those with lower SES. Concerning career self-concept and vocational awareness, students with job experience rated higher than those without such experience. (3) The correlation between self-concept and occupational awareness was low, and showed a positive correlation. Further, each aspect of career self-concept could be used to explain occupational awareness. What’s more, two sets of canonical correlations emerged between career self-concept and vocational awareness. Some recommendations was proposed to improved vocational high school students’ career cognition and study in the future.

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KEY WORDS vocational high school students, career self-concept, vocational awareness

Introduction

Vocational high schools have seen a reduction in the number of technical and vocational subjects offered students, specialization learning, and an emphasis on the ability to learn basic abilities. Vocational high schools cultivated the basis for a technical workforce in the past, promoted study in technical colleges' preparatory education, and, when humanities and technology are added, equal an emphasis on all-round education.

When students selected an occupational class, they can learn about personal development, as well as the technical content. Therefore, the survey method was undertaken to try to understand the vocational students' career self-concept and career awareness.

The objectives of this study were:

- Describe the career self-concept and career awareness of the vocational high school students in Taiwan.
- Explore the differences of careers self-concept and occupation awareness among their personological variables.
- Explore a model to explain/predict career self-concept and occupation awareness for vocational high school students..

Literature Review

Theory and Research of Career Self-concept

Adolescence is a critical period of development of career self-concept. Career self-concept is the emphasis on the characteristics of the ability, interests, personality traits and values on the personal choice of an occupation. Super (1953) described that career self-concept was the synthesis of subjective perception and vocational or career related property (Lin Jinkun, 2001). Super (1953) proposed that self-concept is an important foundation for the concept of individual career development. Further, personal career choice is influenced by the realization of their self-concept. Thus, self-concept will get more specific and clear in the career development process when people become more mature. Individual self-concept will be forming during the adolescent period. As the experiences of some of the roles and tasks increase, adolescence will develop career self-concept increasingly by social identity and the gradual integration of professional terminology (Wuzhi, 2000). In this study, career self-concept was defined as "individual perception in career or career-related self-property, including the individual's own skills, values, interests and personality attributes. Career self-concept will be influenced by factors including gender, school property, grade, specialty, family socioeconomic status, work experience, etc.

Related Research on Career Awareness

Occupational awareness was mostly defined under employment preparation, vocational maturity or career maturity. The vocational cognition is influenced by age or stage of personal development. Various experts and scholars have different views on career awareness, and some assessment tools with several elements were developed to evaluate career awareness or cognition. However, these functions in the study can be assured to do diagnosis, education and counseling. (Liu, 2009; 2011) Based on the needs of this study, the researchers defined awareness as including three dimensions: "the grasp of career information", "the level of understanding career or the world of work" and "personal professional work attitude." The level of understanding of the students' career awareness is mainly influenced by gender, schools (including grades and divisions), socioeconomic status and work experience.

Relevant Theory of Career Self-concept and Career Awareness

Pyramid Structure of Information Processing Level

Peterson, Sampson, and Reardon (1991), based on information processing theory, proposed a message processing level pyramid (Pyramid of Information Processing Domains), mainly included three levels: (1) knowledge level, (2) decision making, and (3) the level of the execution process. The basic level of knowledge can be divided into two parts of self-knowledge and occupational knowledge. Self-knowledge contains personal experience, personal self-interest, ability, value and demand personal qualities. Vocational knowledge implies personal knowledge and understanding of the world of occupations or work.

Career Planning Model

Swain (1984) pointed out that career planning consists of three main factors: the relationship among self traits, career information, as well as interaction between personal and environmental factors. The model is comprised of three triangles and a circle. Each triangle is the focus of career planning and exploration. The circular part in the core means career decision linked to other parts in the relationship structure. The first triangle, includes the abilities and aptitudes, interests and needs, and values; the second triangle refers to the "relationship with the environment, including family factors, socio-economic factors, help or resistance factors; the third triangle encompasses education and career information, including participation in lectures, seminars, papers and materials collection, and visiting activities. The core of the structure means one who wants to reach a career goal, and this goal is influenced by the three triangles around the core.

Swain's career planning model showed that personal career development must understand the various traits, collect education and career information, control the master environmental resources for career exploration, and evaluate a variety of career

information and opportunities in a variety of career choices, and then to make a career decision. (Liu, 2012)

Career self-concept is related with career awareness or career development, and career self-concept could predict career development. The purpose of career counseling is to combine the individual and the world of work. Therefore, vocational high schools should establish students' positive career self-concept in order to help students make correct career choice in the future.

Research Method

The researchers conducted a survey to address the research objectives as they had emerged from the literature, and to develop a research framework to analyze the vocational high school students' career self-concept and vocational awareness.

Study Samples

In this study, the population studied was the 2012 students in Yunlin County's public and private senior vocational schools. A total of 9382 students from eight vocational high schools comprised the population. In this study, the sample size ($n=369$) was calculated following the guidelines of Krejcie and the Morgan (1970). For the number of subjects, 2.5 times the required minimum number for a valid sample, the proportionate stratified cluster sampling plan was adopted to sampling 985 students in 25 classes. The valid numbers were 955 subjects to give 97.0% confidence with a 5% margin of error.

Research Tools

This study used a questionnaire, with Likert-type scaling, as the data collection tool. The questionnaire used collected basic personological data, career self-concept scale and vocational cognitive scale.

1. The career self-concept scale includes four levels: career skills, career values, career interest, personality. Content validity and construct validity were established. The internal consistency reliability (Cronbach 's alpha) coefficient was .83.
2. Career Cognitive Scale includes three levels: career information, vocational understanding of work attitude. Eigen value in each subscale was 1.897, 3.547, and 5.179 respectively established construct validity. The Cronbach 's alpha coefficient, for reliability, was .867.

Data Analysis

The statistical analysis was conducted with descriptive statistics, one-way ANOVA, Pearson product-moment correlation coefficient, multiple regression, and canonical correlation.

Result and Discussion

Career Self-concept and Occupational Awareness of Vocational High School Students

The Current Status of the Self-concept of Vocational High School Students in Taiwan

Each statement about career self-concept demonstrated the highest score 4.04 level of the "career value," and 3.74 for the second one "career interest", and 3.63 for the level of personality, and 3.62 for career capability in minimum score level. By the above score, vocational school students hold a more positive view of the future stability, security, salary compensation, independence and service society. On the other hand, for their own to face the future work required of professional knowledge, skills, and problem solving and the ability to communicate, hold more conservative views.

The Current Status of Occupational Awareness of Vocational Students in Yunlin County

Among the various subscale of vocational awareness, the highest average score 4.11 level was "work attitude" , the second one is 3.58 for "career understanding", then the lowest 3.17 followed by "career information" . These score shows that vocational high school students have a higher degree of awareness of attitude to work in the future, but rendered less contact with the case for work in the future.

The Various Differences Analysis of Self-concept and Career Awareness of Vocational High School Students

In order to learn more about differences on career self-concept and vocational awareness for various personological variables by kind of vocational high school student. The result of the single-factor variance analysis (one-way ANOVA) and post hoc multiple comparison were shown in Table 4-2-1:

Table 1

Summary Table of ANOVA Analysis of Career Self-concept and Occupational Awareness on Vocational High Students Personal Background Variables

Scale/ Dimension	Gender	School	Grade	Divisions	SES	Work experience
Career Self- concept	Female> male ($F_{(1,953)}=6.43, p<.05$)					experienced>i nexperience ($F_{(2,952)}=4.15, p<.05$)
Career ability						
Career value	Female> male ($F_{(1,953)}=6.38, p<.05$)					
Career interest	Female> male ($F_{(1,953)}=4.67, p<.05$)			Hospitality> Industrial ($F_{(4,950)}=3.56, p<.05$)		Experience related> inexperience; Experience irrelevant> inexperience ($F_{(2,952)}=10.12, p<.05$)
Personality			g2> g1 ($F_{(2,953)}=4.12, p<.05$)			
Occupation awareness		Private> Public ($F_{(1,953)}=4.72, p<.05$)				Experienced relevant> experienced irrelevant; Experienced related> inexperience; Experienced irrelevant> inexperienced ($F_{(2,952)}=12.43, p<.05$)
Career information		Private> Public ($F_{(1,953)}=11.33,$				Experienced related> inexperienced; Experience irrelevant> inexperienced

		$p<.05$; $(F_{(2,952)}=10.66, p<.05)$
Occupation understanding		Private>Public $(F_{(1,953)}=9.97, p<.05)$		Family>Industrial & Business; Hospitality>Industrial & Business $(F_{(4,950)}=6.86, p<.05)$	High>low $(F_{(2,952)}=3.20, p<.05)$	Experience relevant>experienced irrelevant; Experienced related>inexperienced $(F_{(2,952)}=11.39, p<.05)$
Work attitude		Public>private $(F_{(1,953)}=5.86, p<.05)$	$g2 > g1$ $(F_{(2,952)}=3.85, p<.05)$			

Correlation Analysis among Career Self-concept and Occupational Awareness of Vocational High School Students

Correlation coefficient analysis summary was showed in Table 2. Career interest variable was accordant with the overall and each subscale occupational awareness with the overall highest correlation coefficient ($r = .593$). The correlation coefficient of the "personality" and "career information was the lowest ($r = .073$), and the rest of the correlations coefficients were between these two numbers. In addition to the lower correlation between "personality" variable and "career information", vocational high school students reported a positive correlation between career self-concept and occupational awareness.

Table 2

Summary Table of Pearson Correlation Coefficient among Career Self-concept and Occupational Awareness

Variables	Career information	Occupation understood	Work attitude	Occupational awareness
Career ability	.25	.45	.31	.45
Career value	.15	.26	.38	.34
Career interest	.34	.58	.40	.59
Personality	.07	.21	.25	.23
Career Self-concept	.30	.55	.49	.59

The Prediction Analysis of Career Self-Concept on Occupational Awareness

Statistical analysis revealed four predictive variables significantly predicted the criterion variable in multiple correlation coefficient of $R=.657$, explained the variance $R^2=.431$, representing the four variables can predict "occupational awareness," 43.1% of the variance, shown in Table 4-4-1.

The individual variable explanatory power of the career interest in interpretation of 35.1% and sequential interpretation ratio from "career ability", "career value" and "personality" were 5.6%, 1.7% and 0.7% respectively. The joint explanatory power of the four variables was 43.1%. The standardized regression equation was:

$$\text{Occupational Awareness} = .443 \times \text{career interest} + .233 \times \text{career ability} + .128 \times \text{career value} + .086 \text{ personality}$$

This analysis focused on how the career self-concept variables can predict the occupational awareness variable. The predictors included career self-concept, career values, career interests and personality traits with the occupational awareness as the criterion. Stepwise multiple regression analysis was used to select the explanatory power of predictive variables.

Table 3
Summary Table of Stepwise Multiple Regression for Predictive Variables of Career Self-Concept on Occupational Awareness

Selected order of the variables	R	R ²	ΔR ²	F value	B	β	Collinearity diagnostics	
							Variation coefficient of expansion (VIF)	Condition index (CI)
Intercept					21.16			
Career interest	.59	.35	.35	516.34 ***	1.12	.44	1.28	12.18
Career ability	.64	.41	.06	327.19 ***	.77	.23	1.22	16.40
Career value	.65	.42	.02	233.76 ***	.52	.13	1.15	16.91
Personality	.66	.43	.01	180.18 ***	.16	.09	1.07	25.17

*** $p < .001$

This analysis focused on how the career self-concept variables can predict the occupational awareness variable. The predictors included career self-concept, career values, career interests and personality traits with the occupational awareness as the criterion. Stepwise multiple regression analysis was used to select the explanatory power of predictive variables.

According to the findings from the table 3, "career interest" can significantly predict occupational awareness ($R^2=.351$, $F=516.34$, $p<.001$). Further, the significant predictors for occupational awareness variables followed by "career ability" ($\Delta R^2=.056$, $F=327.19$, $p<.001$), "career value" ($\Delta R^2=.02$, $F=233.76$, $p<.001$), and personality ($\Delta R^2=.007$, $F=180.18$, $p<.001$). The total explanatory power for the integrity of the test was 43.1% ($R^2=.43$, $p<.001$). This result demonstrated that for vocational high school students, the higher their career self-concept, then the higher their occupational awareness will be. Thus, career self-concept can explain the vocational high school students' occupational awareness.

The Canonical Correlation among Career Self-Concept and Occupational Awareness for Vocational High School Students

Table 4 showed two canonical correlation coefficient of the level of significance. The first canonical correlation coefficient was .69 (Wilk's $\Lambda=.50$, $p<.001$), and the second canonical correlation coefficient was .24 (Wilk's $\Lambda=.94$, $p<.001$). Therefore, the four variables of career self-concept, primarily through two typical factors affect the three variables of occupational cognition, and two typical factors explained 99.75% of overall canonical correlation analysis.

According to Table 5, individual factors variance explained by X set of four variables of career self-concept in a canonical variable X_1 and explained variation of 42.1%. The second canonical variables X_2 explained variation of 20.9%, the total X group extracted from two typical factors can explain the X group 62.9% of the total variance of the four variables. Y group of three variables through two canonical factors explained 21.0% of the total variance of the four variables X group.

Y set group of three variables career awareness from first typical variables η_1 explained variation of 53.6%, and the second canonical factor η_2 explain the variability of 22.3%. Y group totally extracted from two canonical factors explained 75.9% of the total variance of Y group of three variables. X group of four variables through two canonical factors explained 26.5% of the total variance of Y group of three variables.

Table 4

Canonical Correlation of Career Self-Concept and Occupational Cognition

Typical Factors	Eigen Value	Wilk's λ	F value	Cumulative Explained	Correlation Coefficient	p
1	.89	.50	63.21 ***	93.35	.69	.00
2	.06	.94	9.92 ***	99.75	.24	.00
3	.00	.99	1.15	100.00	.05	.32

*** $p < .01$

Career self-concept of the four main independent variables through two canonical factor affected four occupational awareness variables, and the two canonical correlation coefficients were .69 and .24 respectively.

As shown in figure 4-5-1, the career self-concept and occupational awareness were impacted through the first canonical factor effects, which career ability and career interest showed more stronger effects on occupational awareness,

Table 5

Summary Table for Canonical Correlation Analysis between Career Self-Concept and Occupational Awareness

X Variables	Canonical Factors		Y Variables	Canonical Factors	
	χ_1	χ_2		η_1	η_2
Career ability	.69	.16	Career information	.52	.26
Career Value	.51	-.75	Occupation awareness	.91	.31
Career interest	.90	.22	Work attitude	.71	-.71
Personality	.37	-.44			
Extracted variance%	42.06	20.86	Extracted variance%	53.58	22.29
The number of the amount of overlap	19.82	1.20	The number of the amount of overlap	25.25	1.28
ρ^2				.47 ***	.06 ***
Canonical correlation				.69 ***	.24 ***
p -value				.00	.00

*** $p < .001$

First canonical factor from X sets of four variables in a canonical factor "career interest" and "career ability" with the X group χ_1 related to the canonical structure coefficient of .90 and .69. Y group of three variables in its first typical factors η_1 showed relationship as "professional knowledge" and "attitude" for the canonical structure coefficient of .91 and .71. First canonical correlation, the dependent variable "professional knowledge" and "work attitude" by "career interest and career ability", said the impact is positive, because the values are positive.

Second canonical factor from X sets of four variables, "career value" showed in X group's second canonical variables χ_2 . The most closely related to the typical structure coefficient was -.75; Y group of three variables in the second canonical variables η_2 . The most closely relationship was the work attitude with the canonical structure coefficient -.71. The second canonical factor, according to the variable "work attitude", was mainly influenced by the "career value", because of its values were negative. Therefore, the impact was positive.

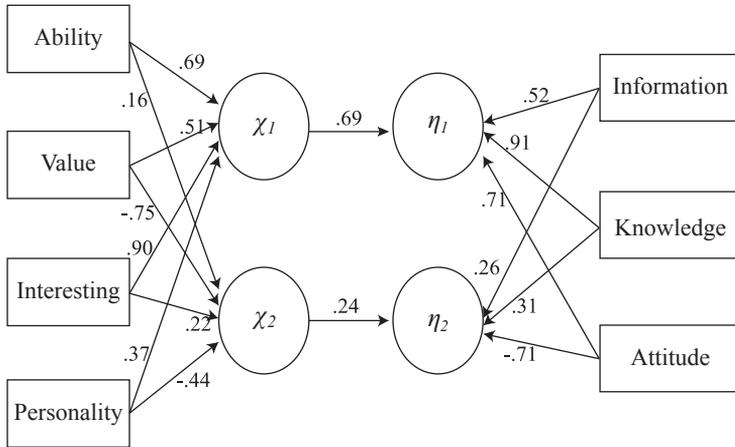


Figure 1. Diagram of canonical correlation between career self-conception and occupational awareness

Conclusion and Recommendation

Conclusion

Some conclusions were resulted from this study:

- Vocational high school students scored above the mid-point on the degree of career self-concept and professional knowledge.**

Vocational high school students had a positive understanding in career self-concept and occupational awareness.

2. Various background students perceived significantly different career self-cognition and occupational awareness.

Female students had a higher degree of cognition than male students in career self-concept. On Career self-concept, female students were higher than male students. Female students had more positive development on the current and future career cognition in the "career value" and "career interest." According to the results, it is necessary for the educational institutions to further strengthen male students' career development.

Private vocational school students showed higher level of knowledge than the public vocational students in occupational awareness. In addition to the work attitude, the public vocational students is higher than the level of private vocational students, private vocational students overall higher in career awareness and career information, career to understand the level than public vocational school students. Private vocational students showed a more positive attitude to grasp and understanding of the world of work or the workplace for information about future employment. Findings for occupational cognition, educators should strengthen the guidance of public vocational schools' students to collect information on the employment as well as the understanding of the world of work.

Second-year vocational high school students showed higher cognition than the first-year students in the "personality" and "attitude" level. Sophomores had a higher degree of understanding for their own career self-concept of "personality" than the first year students. Compared to the first-year students, sophomore showed self-personality clearly and distinctly. Compared to the first year students, sophomores had a higher degree of career cognitive level on "work attitude." Sophomores on the future performance of work are clearer than the first grade students.

Hospitality class students showed higher cognition than other students on the level of "career interest" and "occupation understanding". The Hospitality Class Division students in career self-concept of "career interest level is higher than the students of the Industrial Products Division. They had a clear and explicit understanding of the extent of their interest of their own career development. Examining vocational occupational understand cognitive level, hospitality students scored higher than the industrial and commercial classes students. Students of hospitality and home economics subjects for future work salary message of the work environment and development opportunities showed a more positive understanding attitude.

High family socioeconomic status of vocational high school students showed higher cognition than the lower family socioeconomic status students in the "Occupational understanding." High family socioeconomic status of students in vocational occupational understand cognition level were higher than students of low family socioeconomic status. High family socioeconomic status students were better than students of low socioeconomic status at understanding the world of work or workplace salary, working conditions, working hours, development opportunities and information to understand. Therefore, students with low family socioeconomic status should be given more information on the workplace or the world of work.

The vocational high school students with relevant work experience showed higher career cognition than inexperienced students in career self-concept and vocational awareness. Students with work relevant experience significantly showed higher cognition than those who without work experience in career self-concept and vocational awareness. In career interest level, the students with work experiences were significantly higher than students without work experience. Vocational high school students with related work experience had significantly higher cognition than those without work experience in level of career information and occupation understood. Students with work experience but unrelated were significantly higher cognition than without work experience students in the level of career information and the occupational understand. Although the purpose of vocational high school students working were not to increase the practical experience in the workplace. Students in contact with the workplace which will affect their concern for the future to engage in work-related messages, and thus enhance students' awareness of career planning. Therefore, under the premise of safety, vocational high school teachers can encourage students to take advantage of the spare time to work or work-study students to increase understanding of the career development.

3. Between career self-concept and occupational awareness showed significant low or moderate positive correlation. Levels of career self-concept could explain occupational awareness

Vocational high school students' career self-concept will affect their career awareness, career self-concept, career interest, career ability levels affected occupational awareness, career information, career to understand and work attitude. Therefore, when vocational school students have higher career interest and career ability, then their career cognitive understanding would also be higher.

Levels of career self-concept can effectively predict occupational awareness and individual level. The predictive power of the "career interest" was the best, and followed by the career ability. The higher vocational school students have career interest and career ability, the more clearly and with the higher career awareness.

4. Career self-concept and occupational awareness factors existed canonical correlation between the two sets of variables.

Statistical analysis showed that a total of two typical factors can be extracted. Vocational high school students existed canonical correlation between career self-concept and occupational awareness. The vocational high school students perceived more clear "career ability", "career value", "career interest" and "career self-concept" in the first set of typical factors. Meanwhile, they perceived higher occupational awareness in "career information", "career understanding" and "work attitude". In the second set of typical factors, students who perceived higher career self-concept in "vocational students", "career value" and "personality" showed clearer occupational awareness in "work attitude" and "career cognition".

Recommendation

1. Emphasis on vocational school students' career development counseling, and provide adequate workplace information in appropriate timing.

According to the results of this study, vocational high school students positively perceived their career self-concept and occupational awareness, and there were significant difference on gender and work experience background. This showed that the vocational high school students had a full understanding of their own conditions and workplace information. Thus, to help students to do career choice can improve the most correct career planning judgment. Therefore, recommended that schools and educational institutions should pay attention to the career development counseling for vocational students, and provide adequate job market information, and counseling students to actively obtain various licenses, so that the students can find a good job before their graduation or employment preparation.

2. Encourage students to take advantage on the spare time to work or to work part-time, in order to increase their practical experience

According to the results in the various work experience, students with work experience significantly replied higher career self-concept and vocational awareness than the students who without work experience. This showed that subjects related work experiences were beneficial for vocational high school students in learning the professional skill and performance. Therefore, it is recommended that the school is planning to implement courses, business or occupation units with external industrial cooperation given to professional training and education for the students in the workplace, so that students can make clear their career interesting and understanding the world of job market, the personal traits, skills and career choices.

3. Initiate to collect various workplace information and enrich the professional knowledge and skills for the future career

The study results showed the performance of students in public vocational high professional cognition less advanced than the private vocational high school students, especially in the understanding of two layers of the mastery of career information, and the world of work surface as relatively weak. The reason may be the public vocational school students emphasize academic studies and ignored the results of the employment. Therefore, it is recommended that the public vocational students in preparing entrance exams, at the same time, should also take the initiative to collect information on the world of work to keep abreast of the pulse of the current job market, and with the course of learning, enrich the professional knowledge and skills of their future work.

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Global Trends and Implications on National Qualification Framework

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ABSTRACT The purpose of this study was to explore global trends of National Qualification Framework (NQF) and suggest implications for construction of NQF in Asia countries including Korea. We analyzed adoption purpose, adoption period and level system of NQF in European Union(EU) covering England, Scotland, Spain, and Asia countries including Australia, Malaysia and Singapore to achieve the purpose. NQF are already constructed or planning to be constructed in 130 countries around the world, and the main global trends in NQF are the followings. First, the adoption of NQF is spreading globally to recognize job performance competency in national dimension and to promote labor-force transfer between countries. Second, regional NQF is developing in an effort to transfer the labor force within the region, and to construct a common standard system. Third, trend to mutually link different learning outcomes, including educational and vocational qualifications, is strengthening. Fourth, the countries construct and operate NQF as an important mean to promote lifelong learning. Fifth, NQF are being constructed and operated based on the specific standard of the country. These global trends of NQF provide implications on the construction of NQF in Asia countries including Korea, and they are the followings. First, a social agreement must be in place in prior to the adoption and implementation of NQF. Second, the vertical learning pathways must be designed based on the national competency standards for the smooth operation of NQF. Third, the VET(vocational education and training) and qualifications based on the national competency standards should be expanded, and the linkage between qualifications, education, training and learning experiences should be strengthened through recognizing the learning outcomes. Fourth, NQF must be valid globally through networking with the regional standard system such as EQF and RMQF. Fifth, establishment of the management organization that will administrate and operate NQF should be considered.

KEY WORDS national qualification framework, NQF

Introduction

Adoption of National Qualification Framework(NQF) are recently expanding in many countries with Europe in the center, and globally about 130 nations either already constructed or are planning to construct NQF(Na, 2012; Serban, 2011). NQF imply an integrated standardized framework that links different qualifications (degree, diploma and vocational qualifications etc.) required by the industry for job performance competency. NQF are widely practiced to officially recognize variety of learning outcomes in national dimension(Cho & Lim, 2010).

Apparently many countries are adopting NQF due to the global trend that attempts to establish an internationally comparable standard for the vocational education and training(Cedefop, 2010). Reflecting such trends, Asian countries established Regional Model Qualifications Framework(RMQF) in 2006 to vitalize collaboration and to promote the labor transfers between countries. European Union (EU) adopted European Qualifications Framework(EQF) in 2008. It is the qualification system to provide a framework that connects individual country's NQF, and covers primary and secondary education to vocational education and training (Cho & Lim, 2012; European Commission, 2013). European countries also adopted and operate European Credit System for Vocational and Training(ECVET) in vocational education and training sector from 2009 followed by the official selection of EQF(European Commission, 2011; Lee, Kwon, Park, & Lee, 2012).

Construction of NQF based on regional NQF in England, Scotland, Spain, Australia, Malaysia and Singapore provides comprehensive signaling on how different qualifications, including degree, diploma and vocational qualifications, mutually cooperates and what kind of qualifications can contribute on the improvement of job performance competency(Lee, Kim, & Kim, 2008). It acts as a guideline for an individual to systematically approach required education and training to develop job performance competency during one's entire life and also prevents repetition in the learning. Also, NQF are constructed and operated as a national-dimension infrastructure, allowing assessment and recognition of various forms of learning outcomes(Lee, Cho, & Park, 2007).

Hence it is the global trend for a country to construct and operate NQF in order to recognize one's achievements, including knowledge and skills, and to secure international mobility of the labor force. And constructing NQF that is in accordance with the nation's status through linking education, training and status system is being particularly highlighted.

Therefore the purpose of this study is to draw implications on constructing NQF in different countries including Korea, through the analysis of NQFs' global trends. We separated the trends into regional and national-dimension to analyze the adoption purpose, adoption period, and level system, and suggested implications on constructing NQF for Asian countries including Korea.

Review of the Literature

Concept of National Qualification Framework(NQF)

National Qualification Framework(NQF) conveys an integrative level system that allows linkages between various qualifications(education and training outcomes, degree, diploma and vocational qualifications etc.) in terms of job performance competency required by industrial site(Kim, Lee, Joo, Park, & Choi, 2011; Cho et al., 2010; Cho et al., 2012). Korea's Framework Act of Qualification article 2, section 3 states the qualification system as a standard system of qualifications that allows mutual-linkage between academic education, vocational training and qualification based on National Competency Standards(NCS).

When the concept of NQF is expanded in terms of adoption and practical purposes, NQF can be defined as a tool for recognition of the achievements in national-dimension that one is holding including knowledge and skills(Cho et al., 2010). Hence, NQF can be said as a national tool that integrates and links many qualifications(degree, diploma and vocational qualifications etc.) to build equivalence of various learning outcomes. And NQF assists mutual linkage and equality maintenance of the learning experiences and acquisition of qualifications for the lifelong learners(Kim et al., 2011).

NQF bases on National Competency Standards(NCS), and it can be narrowly interpreted as a systematization of equivalence of various methods(education, training, qualification, experiences etc.) related to improvement of job performance competency that a labor requires for particular duty. On the other hand, it can be widely interpreted as a systematization of market value between various job performance competency(Uh, 2012).

Although the concept of NQF are defined in diverse of ways outside of Korea, it is the most importantly stressed to promote continuous lifelong learning through the construction of NQF. OECD(2007) defines NQF as a tool to develop and/or classify the completed learning level based on series of criteria, and performs in establishing basis for recognition of the qualification's quality, accessibility, linkage in public or labor market intra- and internationally. Also, Cedefop(2011) conceptualizes NQF as a tool to explain and compare the qualifications developed in national, international or industry field.

After all, NQF is the framework that presents equivalence of education, training, qualification and experience, and implies integrative standard system that can link diversity of abilities required by industry field in terms of job performance competency(Na, 2012; Cho et al., 2012).

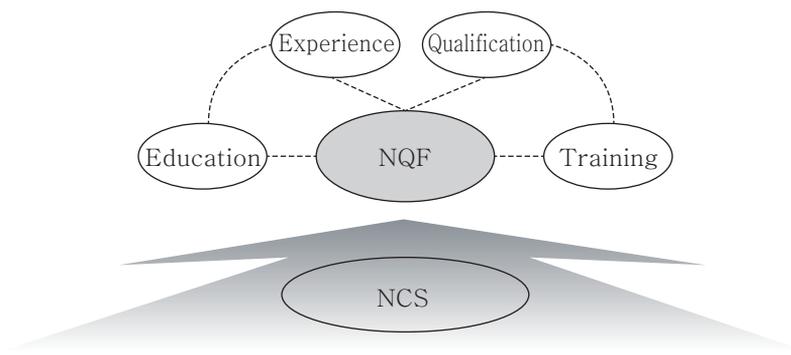


Figure 1. Concept of National Qualification Framework

Source: Na. (2012). Strategy to Build NQF for Vocational Skills Assessment Hub. HRD Service of Korea.

Trends in National Qualification Framework Research

Studies related to NQF are actively conducted since the development of National Competency Standards in 2002. The early studies generally suggest the necessity of NQFs' construction in order to create a concrete level system(Lee, 2006; Lee et al., 2007; Cho et al., 2003), whereas the recent researches provide more specified guidelines for the management of NQF(Kim et al., 2011; Na, 2012; Lee et al., 2008; Cho et al., 2010; Cho et al., 2012).

It is generally emphasized that the construction of NQF is necessary in a way to provide signals informing how various qualifications are mutually linked, and what kind of qualifications can contribute to the improvement of job performance competency(Cho et al., 2003). And the industries acknowledge the adoption of NQF is advantageous for them as 51% answered positively on the adoption(Cho et al., 2003). Furthermore, the pilot studies reason NQF introductions is essential 1) to aid recognition of a broader range of learning outcomes in national-dimension 2) to eliminate wasted elements in the education, 3) to open up qualifications for achievements(or qualifications) awarded outside of the formal education and training, 4) to enhance permeability and comparison of educational and vocational qualification, 5) to provide reference for quality assurance in national-dimension, and 6) to enhance international mobility of variety of qualifications(Kim et al., 2011; Cho et al., 2010).

The level system of NQF is established based on the information on knowledge and skill, autonomy, influence, and complexity obtained through the industrial surveys and benchmarked foreign cases. Early studies introduced six-level or seven-level structured level systems(Lee et al., 2007; Lee et al., 2008; Cho et al., 2003), but it is shifting to eight-level structures recently ranging from level 1 (no high school diploma) to level 8(doctoral degree)(Kim et al., 2011; Cho et al., 2010; Cho et al., 2012).

To appropriately manage NQF, it is suggested to 1) get social acceptance of adoption and application of NQF, 2) establish standardized qualification system, 3) strengthen vertical linkages of NQF, 4) strengthen horizontal linkages of NQF, 5)

strengthen linkages between the national technical qualification and educational degree, and 6) organize a management authorities exclusively for NQF(Na, 2012; Cho et al., 2010).

Trends of National Qualification Framework in Regional Dimension

European Qualification Framework(EQF) of EU

The EQF provides a common reference framework which assists in comparing the national qualifications systems, framework and their levels. It serves as a translation device to make qualifications more readable and understandable across different countries and systems in Europe, and thus promote lifelong and life-wide learning, and the mobility of European citizens whether for studying or working abroad(Cho et al., 2009; Cho et al., 2012; European Commission, 2013).

Discussion on the introduction of EQF began in 2000 as the argument, on the necessity for a standardized system for accurate comparison between different qualifications and weight, rose up. By 2004, EQF was started to actively develop as a common standard satisfying the EU members' needs and finally agreed to officially adopt EQF by 2008(Cho et al., 2010).

The level system of EQF is composed of eight levels, ranging from level 1(i.e. NVQ 1) to level 8(i.e. doctoral degree), and it covers all qualifications obtained from education and training. The standard emphasizes on learning outcomes rather than the learning input, such as the duration, and it is specified into 3 categories: knowledge, skills, and attitudes(Global Education Company, 2012)

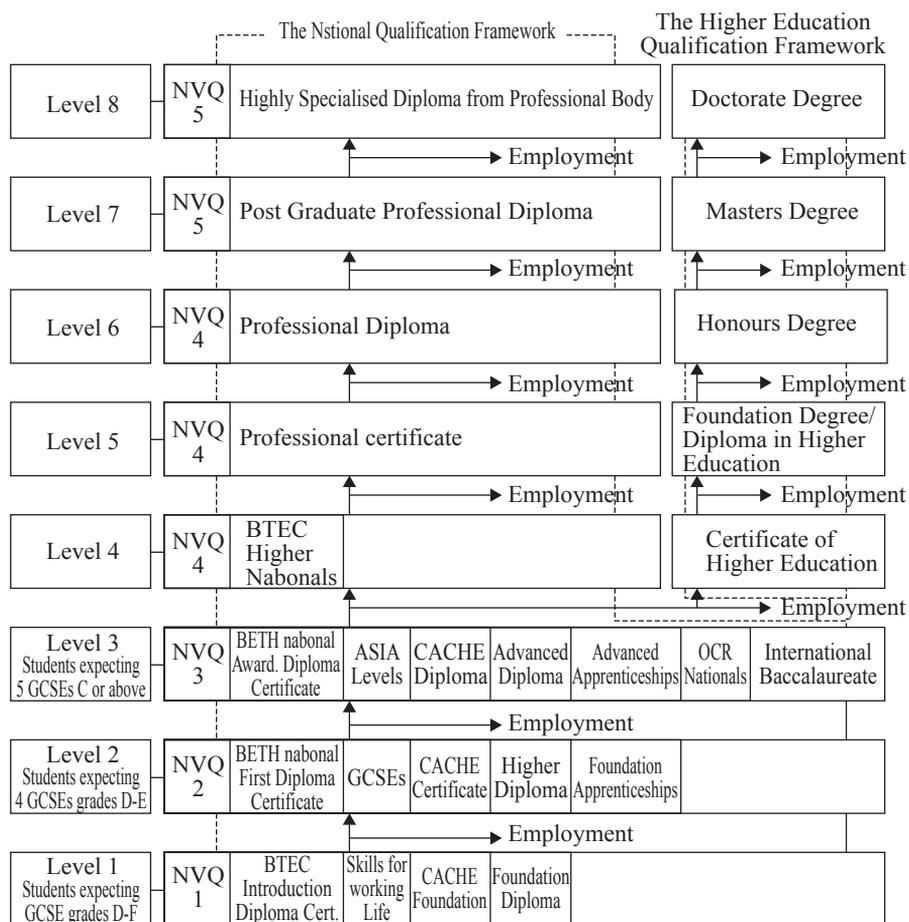


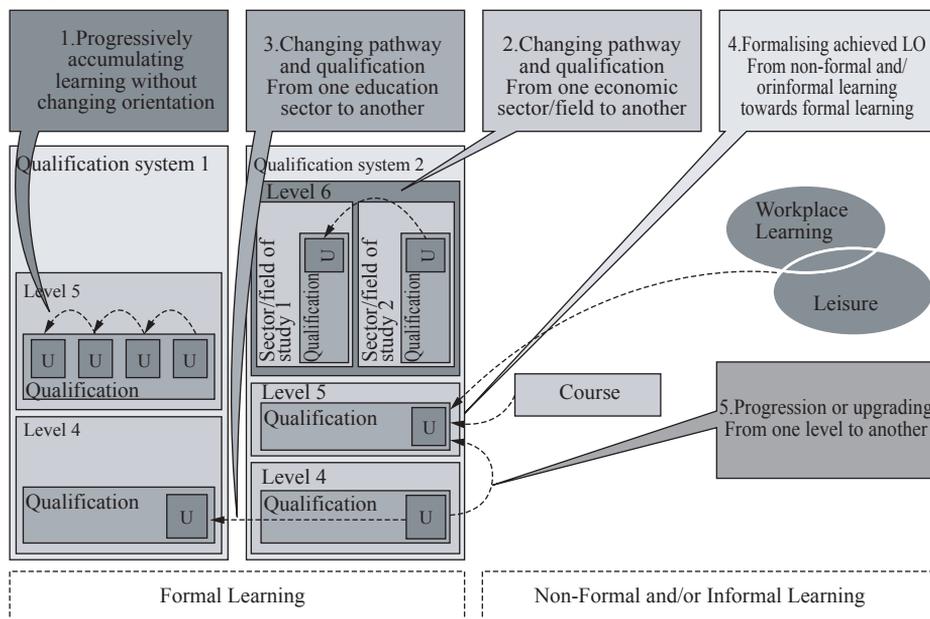
Figure 2. The Level System of EQF

Source : Global Education Company. (2012). European education structure. <http://www.transglobe-edu.com/global/europe>

As EQF is officially adopted in Europe since 2008, the European countries also adopt and manage European Credit System for Vocational and Training (ECVET) from 2009 as a basis of proper operation of EQF (European Commission, 2011). ECVET regulates the transfer and accumulation of the credits as well as the design of the qualification, and also provides the system that assures the learning experience in different or exceptional situation is comparable with the experiences in typical cases (Cho et al., 2012). ECVET is widely practiced for the lifelong learners as a measure aiming for 1) qualification acquisition through continuous learning and accumulation of credits, 2) supporting a learner's change in career path, 3) supporting a learner's acquisition of the new qualification, 4) a tool to recognize non-formal or

informal education and learning experiences, and 5) a tool for mutual recognition between qualification system and level system(European Commission, 2011).

Legend:LO-Leaning Outcomes; Qualification; U-Unit Of Learning Outcomes



Note:All examples in the upcoming sections of this note are hypothetical. The main features of these examples are inspired by what is already possible in some EU countries. However, the detailed descriptions in the examples are not based on real-life cases.

Figure 3. Using ECVET to Support EQF

Source: European Commission(2011). Using ECVET to Support Lifelong Learning.

Regional Model Qualification of Asia

Regional Model Qualification(RMQF) of Asia was adopted to establish the basis of regional collaboration among the Asian countries, and to promote the mobilization of the skilled labor-force between countries(Na, 2012; Cho et al., 2010). RMQF was led and developed by International Labor Organization(ILO) in 2006, and is in preparation process to develop a guideline that can be validated in APEC region in future(Cho et al., 2012; ILO, 2006). ILO has developed the RMQF which is designed to 1) respond to needs of constituents, 2) serve as common platform on skills, 3) integrate all ILO skills activities into a single workplan(ILO, 2006).

The level system of RMQF comprises of eight levels as in EQF of EU, ranging from level 1(entry-level skills for the new worker) to level 8(advanced level involving conceptual thinking and knowledge creation).

RMQF Level	
Level 8	Advanced level involving conceptual thinking and knowledge creation
Level 7	Professional worker
Level 6	Technologist
Level 5	Technician
Level 4	Fully qualified tradesperson
Level 3	Skilled worker in one or more areas
Level 2	Semi-skilled worker
Level 1	Entry-level skills for the new worker

Figure 4. The Level System of RMQF

Source : Cho. (2010). Cases of Qualification to Take Advantage of the Standard in Developed Countries. KRIVET.

Trends of National Qualification Framework in National-Dimension

NQF of the United Kingdom(England)

NQF of the United Kingdom(England) is developed and operated to enhance the stakeholders' participation, accessibility and sustainability on the education and training and to support lifelong learning by letting the stakeholders to choose the most suitable learning methodology and routes through providing adequate information on relationships between qualifications and explanations on the learning contexts(Cho et al., 2009). It is adopted particularly to motivate stakeholders' learning, to suggest career development pathway, to prevent overlaps between qualifications, and to prevent omission of important learning experience(Na, 2012).

The United Kingdom(England) constructed and operates NQF from 2003. The country also selected and operates Qualification and Credit Framework(QCF) from 2008, as a new means of managing the learning experiences required for the acquisition of qualifications. The QCF is a new credit transfer system which has replaced the NQF. It recognises qualifications and units by awarding credits(Ofqual, 2013). Qualifications that use the QCF rules are made up of units. This provides flexible ways to get a qualification. Each unit has a credit value which tells you how many credits are awarded when a unit is completed. The credit value also gives an

indication of how long it will normally take you to prepare for a unit or qualification. One credit will usually take you 10 hours of learning(Ofqual, 2013).

QCF comprises of 8 levels as in previous NQF, and it is linked to the Framework of Higher Education Qualification(FHEQ). Each level informs the stakeholder on where they are at, how long it would take to obtain the desired qualification(degree), what contents must be acquired and so on. Also, each unit is recognized by the credits and the acquisition of qualification, and all qualifications can be obtained through accumulation of the credits under the provision of the regulated combination principle(Human Resources Development Service of Korea, 2010).

Level	NQF Levels and examples	FHEQ
Level 8	Specialist awards	Doctoral
Level 7	Level 7 Diplomain Translation	Masters
Level 6	Level 6 National Diploma in Professltional Production Skills	Honours
Level 5	Level 5 BTEC Higher National Diploma in 3D Design	Intermediate
Level 4	Level 4 Certificate in Early Years Practice	Certificate
Level 3	Level 3 Certificate in Small Animal Care	Not applicable
Level 2	Level 2 Certificate for Beauty Specialists/GCSE A~C	Not applicable
Level 1	Level 1 Certificate in Motor Vehicle Studies/GCSE D~G	Not applicable

Figure 5. The NQF Levels and Examples of the United Kingdom(England) Source: HRD Service of Korea(2010). The Study of Education and Training, Qualification System in UK.

SCQF of the United Kingdom(Scotland)

The Scottish Credit and Qualifications Framework(SCQF) is the national credit transfer system in Scotland. It covers all levels of qualifications in Scotland including vocational and higher education qualifications(Ofqual, 2013). The United Kingdom(Scotland) implemented SCQF to set up a national-level qualification system, to strengthen compatibility between varieties of qualifications and to support previous learning experiences(Na, 2012).

The SCQF was designed to help the learners, their family, learning providers and employers to understand different qualifications in Scotland and how they relate to each other. Scotland has many different qualifications ranging from Standard Grades to Highers and Higher National Certificate/Degree to different higher education qualifications. The SCQF divides them into levels which make it easier for the learners, employers and general public to understand the range of Scottish qualifications and making them broadly comparable(Ofqual, 2013).

The SCQF is established and implemented in 2006 in collaboration of Quality Assurance Agency for Higher Education(QAA), the Scotland administration, Scottish Qualifications Authority (SQA), and Universities Scotland(Cho et al., 2012)

There are 12 levels in SCQF, and each level is based on the complexity of the learning material. The credit required for the acquisition of qualification is based on the average duration for the learning process to complete the course. Scottish Credit Accumulation and Transfer(SCOTCAT) point quantifies the learning outcomes to assign its worthiness. SCOTCAT point is based on the amount of time that an average learner will be required to get an achievement in particular level. Hence 1 credit in SCQF means 10 hours of learning, and more learning is required as the difficulty and level of the learning gets higher(Na, 2012; Cho et al., 2012)

SCQF Levels	SQA Qualifications			Qualifications of Higher Education Institutions	Scottish Vocational Qualifications
12			↑	DOCTORAL DEGREE	
11				INTEGRATED MASTERS DEGREE MASTERS DEGREE POST GRADUATE DIPLOMA POST GRADUATE CERTIFICATE	SVQ5
10				HONOURS DEGREE GRADUATE DIPLOMA GRADUATE CERTIFICATE	
9			PROFESSIONAL DEVELOPMENT AWARD	BACHELDER / ORDINARY DEGREE GRADUATE DIPLOMA GRADUATE CERTIFICATE	SVQ4
8		HIGHER NATIONAL DIPLOMA		DIPLOMA OF HIGHER EDUCATION	
7	ADVANCED HIGHER SCOTTISH BACCALAUREATE	HIGHER NATIONAL CERTIFICATE	↓	CERTIFICATE OF HIGHER EDUCATION	SVQ3
6	HIGHER				
5	INTERMEDIATE 2 CREDIT STANDARD GRADE				SVQ2
4	INTERMEDIATE 1 GENERAL STANDARD GRADE	NATIONAL CERTIFICATE	NATIONAL PROGRESSION AWARD		SVQ1
3	ACCESS 3 FOUNDATION STANDARD GRADE				
2	ACCESS 2				
1	ACCESS 1				

Figure 6. The SCQF Levels and Examples of the United Kingdom (Scotland) Source: Na. (2012). Strategy to Build NQF for Vocational Skills Assessment hub. HRD Service of Korea.

NQF of Spain

NQF in Spain was introduced to strengthen the worker’s capability in labor market, and to improve the quality of vocational training. Spain developed the Nation Catalogue of Professional Qualifications(CNCP), which coincides with Korea’s the National Competency Standards, linked with the qualifications (Incual, 2011). The CNCP is an instrument of the national system for qualifications and vocational education and training, which lists the professional qualifications according to the appropriate competences for the professional exercise(Incual, 2013).

Until early 2000, workforce was insufficiently trained in relation to the industrial demand in Spain, and the government tried to solve this problem by implementing NQF based on the CNCP. And Spain completed to develop the standards in a short period of time, utilizing 2,000 manpower pool including those in charges of the

government organizations, expertise in the relevant fields and so on(Na, Uh, Kang, & Cho, 2011).

The level system of the Spanish NQF is comprised of five levels based on EQF, and each level is distinguished based on the difficulty of the job, background knowledge and so on(FLC, 2011). The Spanish NQF level 1(Helper) is equivalent to EQF level 1~2, the Spanish NQF level 2(Worker, who must follow order from the supervisor) is equivalent to EQF level 3~4, the Spanish NQF level 3 (Supervisor) is equivalent to EQF level 5, the Spanish NQF level 4(Manager) is equivalent to EQF level 6, and NQF level 5 is linked with EQF level 7.

Table1
National System for Qualifications and VET

Level	Main Points
Level 1	· Can operate relatively simple jobs with normalized processes in a reduced group based on the limited knowledge and capacity.
Level 2	· Can operate well-defined professional activities in a group with the capacity to utilize particular instruments and techniques within the limited range of techniques. · Requires fundamental knowledge on the activity in interest, and ability to comprehend and apply the process.
Level 3	· Can command different techniques and can be executed in an autonomous way in a group of professional activities. · Responsible for coordination and supervision of specialized work · Assessment of the factors in the process, assessment of the economic repercussions, and demands understanding of the fundamentals of the work.
Level 4	· Can consider and combine variety of technical, scientific, economic or organizational variables to plan actions or to define or develop projects, processes, products or services in a wide group of complex.
Level 5	· Can plan an action or conceive products and services in different and unpredictable contexts in a wide group of professional activities of great complexity. · Responsible for the assignment of resources as well as analysis, diagnosis, design, planning, execution and assessment.

Source: Incual. (2011). National System for Qualifications and VET. p5.

NQF of Australia

NQF was introduced to Australia to link variety of qualification so they can be recognized mutually, and to secure consistency in credit transfers and career development(Keating, 2000). The Australian Qualifications Framework(AQF) is the national policy for regulated qualifications in Australian education and training. It

incorporates the qualifications from each education and training sector into a single comprehensive national qualifications framework(Australian Qualification Framework Council, 2013). The AQF was adopted in 1995, and recently integrated into a single track from previously three separated tracks(school sector, VET sector, Higher Education sector)(Cho et al., 2012).

The level system of AQF is defined by the relative complexity and the depth of achievement to prove the completion of each level, and recently restructured to 10 levels from the previous 8 levels. AQF level 1 is defined by certificate I, level 2 is defined by certificate II, level 3 is defined by certificate III, level 4 is defined by certificate IV, level 5 is defined by diploma, level 6 is defined by advanced diploma and associate degree, level 7 is defined by bachelor’s degree, level 8 is defined by honors bachelor’s degree, vocational graduate Certificate/diploma, graduate certificate/diploma, level 9 is defined by master’s degree and level 10 is defined by doctorate degree.

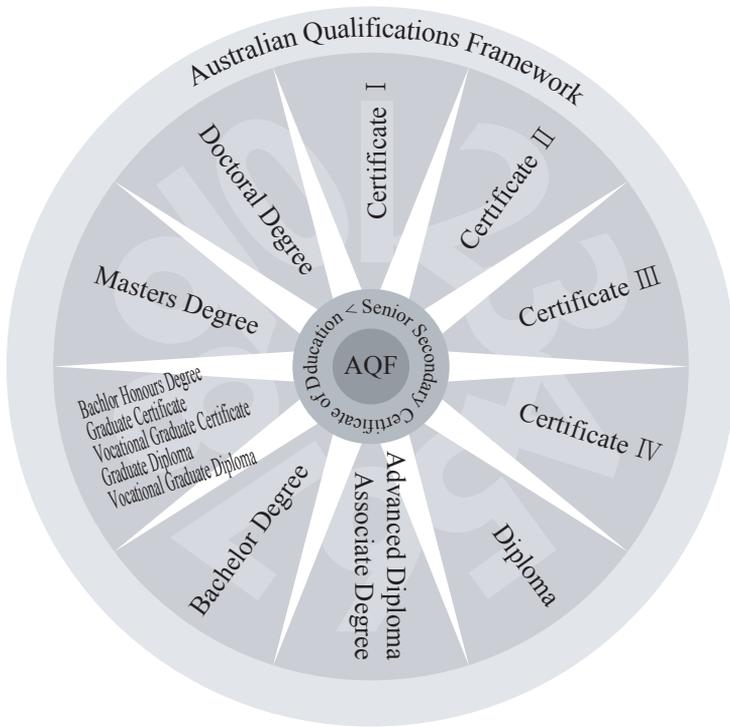


Figure 7. Framework. (2011). Location of AQF Qualification Types in Levels Structure.

NQF of Malaysia

NQF in Malaysia was introduced to provide a solution for their lack of quality inspection of the higher education. The Malaysian Qualifications Framework(MQF) was jointly developed by Quality Assurance Division(QAD) and Lembaga Akreditasi Negara(LAN) in 2002, and implemented since 2005 with the National Higher Education Council’s approval(Cho et al., 2009).

The MQF is an instrument that develops and classifies qualifications based on a set of criteria that are approved nationally and benchmarked against international best practices. It also clarifies the earned academic levels, learning outcomes of study areas and credit system based on student academic load. These criteria are accepted and used for all qualifications awarded by recognized higher education providers. Hence, MQF integrates with and links all national qualifications(Malaysian Qualifications Register, 2009). The MQF also provides educational pathways through which it links qualifications systematically. These pathways will enable the individual to progress through credit transfers and accreditation of prior experiential learning, in the context of lifelong learning.

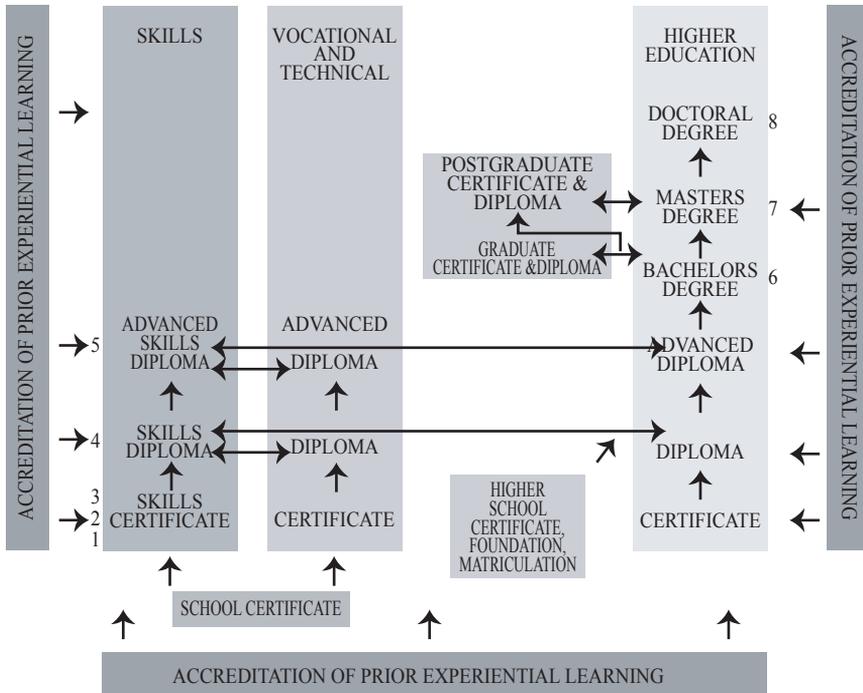


Figure 8. The Qualification Level and Educational Pathway Based on MQF Source: Malaysian Qualifications Register. (2009). The Malaysian Qualifications Framework.

The level system of MQF is comprised of 8 levels(Certificate level 1~3, diploma, advanced diploma, bachelors, masters, and doctoral), and operated by the credit system based on learning load and leaning outcome. It also states the minimum credit required for each level.

Table2
Plans for Internalization of Qualifications.

MQF Level	Qualification	Minimum Credit Required	Total Credit Accumulated
8	Doctoral	-	490 + a
	Research Masters	-	490 + a
7	Fully or Partly Taught Masters	40	490 + a
	Postgraduate Diploma	30	450 + a
	Postgraduate Certificate	20	420 + a
	Bachelors	120	400 + a
6	Graduate Diploma	60	280 + a
	Graduate Certificate	30	220 + a
5	Advanced Diploma	40	190 + a
4	Diploma	90	150 + a
	Certificate	60	60 + a
1 ~ 3	Skills Certificate	Grants certain amount of credits based on the skills and level.	a (assigned credit)

Source: Cho et al. (2009). Plans for Internalization of Qualifications. Korea Research Institute for Vocational Education and Training.

WSQ of Singapore

The Singapore Workforce Skills Qualifications(WSQ) is a national credentialing system. It trains, develops, assesses and recognises individuals for the key competencies that companies look for in potential employees. The WSQ is based on national standards developed by WDA in collaboration with various industries comprising industry sectoral frameworks which serve to improve labour mobility allowing companies in growing industries to easily recruit workers with the necessary skills whilst improving opportunities for workers to enter these industries(Singapore Workforce Development Agency, 2013).

The WSQ system is designed to be a practical, accessible and affordable launching pad for individuals to take charge of their own careers and advancement. It is also a powerful business tool for employers to access and maintain a skilled workforce as it

enhances their competitive edge and advancing their businesses. The different levels of WSQ are from WSQ certificate to WSQ graduate diploma and graduate certificate(Singapore Workforce Development Agency, 2013).



Figure 9. The Level of WSQ

Source: Singapore Workforce Development Agency. (2013). What is WSQ?

Implications of the Global Trend of NQF

Above global trends of NQF provide implications on the construction of NQF in the Asia countries including Korea, and they are the followings. First, a social agreement must be made before the adoption and implementation of NQF. Because NQF includes fundamental considerations and substantial changes in linking education, training, qualifications, and learning experiences, so an agreement between the stakeholders must be preceded. Based on the social sympathy and agreement, modifications of the law and system related to the operation of NQF should be prosecuted as well.

Second, a vertical learning pathway must be designed based on national competency standards for the fluent operation of NQF. And the national-dimension standards must be developed in prior to the operation of NQF. In addition, it is essential to review each of NQF level's minimum amount of learning and learning period based on the developed standards.

Third, the education, training and qualifications based on the national competency standards should be expanded, and linkage between education, training, qualifications and learning experiences should be strengthened through the recognition of the learning outcome. To achieve this, the establishment of credit accumulation and credit

transfer system, like ECVET of EU, should be considered for fluent linkage between education, training, qualifications as well as learning experiences.

Fourth, NQF must be constructed to validate globally. Practical use of NQF should be primarily the promotion of labor force transfer between countries. Hence it should be constructed so that it can be mutually recognizable with the countries, including EQF and RMQF, which will actively transfer the labor force.

Fifth, establishment of the management organization that will administrate and operate NQF should be considered. It is absolutely necessary to have a specialized organization that will provide standards for linkages between different qualifications, and founding and abolition of the qualifications to smoothly operate NQF. Therefore, it is required to consider the new establishment of the national-level organization, like the United Kingdom's QCDA, Ofqual or Australia's AQFC which will continuously check on NQF's standard and guideline.

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