KNOWLEDGE SHARING PROGRAM

2011 Modularization of Korea's Development Experience:

Role and Function of the National Technical Qualification System in the Development of Vocational Ability

2012

Ministry of Employment and Labor

HUMAN RESOURCES DEVELOPMENT SERVICE OF KOREA

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Role and Function of the National Technical Qualification System in the Development of Vocational Ability

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Preface

The study of Korea's economic and social transformation offers a unique opportunity to better understand the factors that drive development. Within one generation, Korea had transformed itself from a poor agrarian society to a modern industrial nation, a feat never seen before. What makes Korea's experience so unique is that its rapid economic development was relatively broad-based, meaning that the fruits of Korea's rapid growth were shared by many. The challenge of course is unlocking the secrets behind Korea's rapid and broad-based development, which can offer invaluable insights and lessons and knowledge that can be shared with the rest of the international community.

Recognizing this, the Korean Ministry of Strategy and Finance (MOSF) and the Korea Development Institute (KDI) launched the Knowledge Sharing Program (KSP) in 2004 to share Korea's development experience and to assist its developing country partners. The body of work presented in this volume is part of a greater initiative launched in 2007 to systemically research and document Korea's development experience and to deliver standardized content as case studies. The goal of this undertaking is to offer a deeper and wider understanding of Korea's development experience with the hope that Korea's past can offer lessons for developing countries in search of sustainable and broad-based development. This is a continuation of a multi-year undertaking to study and document Korea's development experience, and it builds on the 20 case studies completed in 2010. Here, we present 40 new studies that explore various development-oriented themes such as industrialization, energy, human capital development, government administration, Information and Communication Technology (ICT), agricultural development, land development and environment.

In presenting these new studies, I would like to take this opportunity to express my gratitude to all those involved in this great undertaking. It was through their hard work and commitment that made this possible. Foremost, I would like to thank the Ministry of Strategy and Finance for their encouragement and full support of this project. I especially would like to thank the KSP Executive Committee, composed of related ministries/departments, and the various Korean research institutes, for their involvement and the invaluable role they played in bringing this project together. I would also like to thank all the former public officials and senior practitioners for lending their time and keen insights and expertise in preparation of the case studies.

Indeed, the successful completion of the case studies was made possible by the dedication of the researchers from the public sector and academia involved in conducting the studies, which I believe will go a long way in advancing knowledge on not only Korea's own development but also development in general. Lastly, I would like to express my gratitude to Professor Joon-Kyung Kim for his stewardship of this enterprise, and to his team including Professor Jin Park at the KDI School of Public Policy and Management, for their hard work and dedication in successfully managing and completing this project.

As always, the views and opinions expressed by the authors in the body of work presented here do not necessary represent those of KDI School of Public Policy and Management.

May 2012

Oh-Seok Hyun

President

KDI School of Public Policy and Management

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Summary

Korea has promoted industrialization under its national economic development plans that were commenced in 1960 and needed to train and produce skilled technical workers during this process. Accordingly, each department of the government introduced a national qualification system focusing on the area of technology by using the qualification systems of other countries, such as Germany and Japan, as models. The early qualification systems contributed to transforming Korea's industrial structure from an agriculture-centered into a manufacturing-centered, and established a basis for national basic industries.

Since then, national qualification systems, which had been operated under the individual business laws according to the promotion of heavy chemical industry preference policies for technicians at the national level, were integrated into the National Technical Qualification Act in 1973. With the enactment of this Act, many qualified technicians needed by industry were developed, and the qualification system has been constantly improved in accordance with the needs of the field.

The history of Korea's national qualification system since the enactment of the National Technical Qualification Act can be divided into the introduction period, the development period, and the maturity period.

The characteristics of the introduction period of the national technical qualification system (1973~1981) are as follows:

First, the government reasonably established the legal system for the systematic establishment of the national technical qualification system.

Second, it unified the qualification tests operated by each department into qualification tests operated by the "Korean Technical Testing Service" in order to promote the efficiency of system operation.

Third, it fostered a capability-centered social consensus that technicians should receive preference, even in a societal atmosphere that placed an emphasis on having graduated from a prestigious university rather than attaining specific skills.

Fourth, it gave preference to certificate holders through laws and regulations at the governmental level.

Gaining a foothold through the operation of the national technical qualification system in the introduction period, the qualification system was stably operated in the development period.

The characteristics of the development period of the national technical qualification system (1982~1997) are as follows:

First, the vocational training agencies for fostering technicians and the qualification testing institutions for assessing vocational ability were integrated.

Second, the qualification tests in the office work and service areas implemented by each department were absorbed into the National Technical Qualification Act. This resulted in the expansion of the scope of qualification tests in all industrial areas.

Third, the basis for the operation of qualification systems focusing on each industrial field was established through the connection of jobs, vocational training and qualification.

Fourth, refresher training and effective term of qualification were introduced and operated to enhance work performance and maintain the qualification quality for national technical qualification holders.

Subsequently, the national technical qualification system was established in its current operation method through the reorganization of the grade system in 1998.

The characteristics of the maturity period of the national technical qualification system (1998~2010) are as follows:

First, as the classification of technology and skill became more difficult due to the convergence of industrial technologies, the previous 8-grade system was reorganized into the 5-grade system.

Second, the "National Certificate System for Qualification in the Private Sector," in which the nation certifies qualifications given in the private sector, was introduced and implemented to reduce the rigidity of the operation of the national qualification system.

Third, the items of qualification were actively promoted to effectively cope with the changes in the industrial structure and labor demand.

Fourth, the provision of qualification information for the general public and the examinees' convenience were reinforced through the interconnection of the qualification system using information technologies.

Fifth, the practical fields of qualification were reinforced utilizing National Competency Standards (NCS) for the qualification system.

The national technical qualification system significantly contributed to government-driven economic development in the initial step of industrialization during the 1970s.

The national technical qualification system, which more than 5 million people enter annually, has played a pivotal role as a human resource development infrastructure leading the development of vocational ability in Korea. The qualification system contributed significantly to motivation for re-employment among people who lost their job due to the Asian economic crisis at the end of 1990s and the global financial crisis at the end of 2000s, while helping them to recover their confidence. In addition, the approximately 5 million information technology personnel who were generated through the operation of a qualification system for IT became the foundation of Korea's rapid growth into an IT powerhouse.

For developing countries seeking to introduce a policy for vocational ability development based on the national technical qualification system in Korea, the following implications will be provided:

First, for the successful establishment of such a system, it is necessary to objectively analyze the domestic environment and to introduce a government-driven qualification system reflecting the nation's industrial environment.

Second, it is necessary to develop the grades and items of qualification by reflecting industrial needs according to the level of economic development.

Third, it is necessary to install an organization to operate the qualification system at the national level, and to clearly specify the role of each organization to secure public confidence in the operation process.

Fourth, it is necessary to establish the qualification system through legislation of a certificate holder preference policy.

Fifth, it is necessary to secure the quality of certificate holders and maintain public confidence in qualification itself by establishing refresher training and effective term of qualification.

Sixth, it is necessary to computerize the overall management and operation of the qualification system and provide useful information to examinees.

Finally, it is necessary to make efforts to develop a virtuous cycle of qualification in the labor market by reinforcing the research function for the constant development of the qualification system.

Thus far, Korea's national technical qualification system has played pivotal roles in national economic development by responding flexibly to changes in the domestic/overseas environment, supplying certified human resources to the labor market, and more. Korea's national technical qualification system will be constantly developed by reflecting the industry demand.

2011 Modularization of Korea's Development Experience
Role and Function of the National Technical Qualification System in the Development of Vocational Ability

Chapter 1

Introduction

Introduction

Korea's qualification system was developed to foster and supply the human resources needed for the nation's economic development. Despite its short 60 year history, the national technical qualification system has contributed to rapid economic development and national human resource development by generating high-quality verified technicians.

In particular, with the national technical qualification system, Korea was able to become an "aid country" supporting developing countries all over the world, a big change from its previous position of receiving aid from ODA or other countries. Since Korea's experience in economic development and its national technical qualification system may be a good benchmarking example for other developing countries, this should be systematically arranged and considered.

This study examines how Korea's national technical qualification system was formed and developed over time, and how the national technical qualification system contributed to the nation's economic development. Through this examination, it is hoped that Korea's experience and knowledge can be shared with developing countries that consider the introduction of a qualification system.

For such purposes, this study examined the relevant documents, such as data from government archives, the history of the qualification system, and historical documents held by Human Resources Development Service of Korea, and interviewed policy-makers involved in the development of the qualification system.

This study consists of 5 sections except the Introduction, which are as follows:

Section 2 described the situation prior to the introduction of the national technical qualification system, and examined the necessity for the creation of the qualification system.

Section 3 examined major changes through a SWOT analysis step by step, and divided the history of changes occurring after the introduction of the national technical qualification system into the introduction period, the development period, and the maturity period.

Section 4 explained the overall operation of the current national technical qualification system.

Section 5 explained the necessity and role of the national technical qualification system at the individual level, the corporate level and the national level.

Finally, section 6 gives some advice and implications so that developing countries can benchmark Korea's national technical qualification system.

Chapter 2

Creation of the National Technical Qualification System

1. Socioeconomic Environment before the Enactment of the National Technical Qualification Act
2. Creation and Operation of Qualifications before the Enactment of the National Technical Qualification Act

Creation of the National Technical Qualification System

1. Socioeconomic Environment before the Enactment of the National Technical Qualification Act

Korea was liberated after 40 years of "Japanese Forced Occupation" in 1945, but had to experience the Korean War for 3 years from 1950. As a result, the country's economy and labor market remained in the poorest conditions. In order to break away from such difficult economic and social conditions, the Korean government promoted "labor-intensive economic growth," beginning with the 1st Economic Development Plan in 1962, and simultaneously made efforts for "Human Resource Development."

The objectives of the 1st Economic Development Plan were to establish economic independence and to modernize and industrialize the previous industrial structure through labor-intensive industry. The success of the 1st Economic Development Plan in the late 1960s made it possible to transform Korean society from an agriculture-centered structure into an industry-centered structure. Accordingly, the size of industry was significantly expanded, and the specialization of production began.

The 2nd Economic Development Plan in 1967 was promoted with the objective of export-driven industrial growth focusing on light industry, based on international aid. The booming global economy at that time made it possible to achieve the objectives of the Economic Development Plan.

Along with the success of the 1st and 2nd Economic Development Plans, occupations in Korean society began to be subdivided with the emergence of new industries. Such changes in industry and occupation created the need for more specialized and skilled personnel in the labor market. However, there was a limitation that the existing human resource development focusing on regular education could not keep up with the need for specialized personnel. Therefore, the Korean government introduced the "Vocational Training System"

in 1967, to foster specialized personnel systematically. Through this, vocational training and human resource development in Korea began in earnest.

The purpose of the "Vocational Training System" was to foster skilled technical experts and engineers through education and training based on job capability in each field of industry. Keeping this purpose in mind, the government established a national technical qualification system to assess the vocational ability of human resources.

<Table 2-1> shows the major accomplishments of the 1st and 2nd Economic Development Plan. Such accomplishments can be considered the results of securing an abundant and low-cost labor force through the vocational training system.

Table 2-1 | Plan and Performance of the 1st and 2nd Economic Development Five-Year Plan (1962 ~)[1]

Classification	1962 (Unit)	1966		1971	
		Plan	Performance	Plan	Performance
GNP	USD 126.7 hundred million	137.6	180.6	233.1	309.0
Rate of economic growth	2.2 %	7.1	7.8	7.0	9.8
Economically active population (Increase rate compared to the plan)	8,343,000 (%)	-	9,071,000 (2.9)	-	10,407,000 (2.8)
Employed population	7,662,000	-	8,423,000	-	10,066,000
Rate of unemployment	8.2 %	-	7.1	-	4.0

Note: Economically active population and employed population based on 1962; rate of unemployment based on the 1963 measures from the Economic Planning Board.

1 Vocation Training Research Center, History of Development of Vocational Training in Korea, 1989, pp158~164 table reorganized.

2. Creation and Operation of Qualifications before the Enactment of the National Technical Qualification Act

Securing the technical manpower necessary for industrial and economic development will be possible through the establishment and operation of an effective qualification system. The qualification system that Korea operated before the enactment of the National Technical Qualification Act was modeled after the license systems of Japan as well as those of European countries. The qualification system at that time was operated by the nation, and focused on licenses directly related to the life, safety and property of the general public.

On the other hand, qualifications in areas other than manufacturing industry, such as office management and services, were established and operated by the specialized community in the private sector. In particular, qualifications such as abacus calculation, bookkeeping, or typing skill were administered by both the nation and the private sector.

The increasing demand for technicians with economic development has constantly expanded the need for the operation of a qualification system. Due to this necessity, qualifications were established and operated sporadically depending on the special purposes of relevant department or business legislations. <Table 2-2> shows the national qualification tests of around 1970, which were separately implemented according to the individual business legislations. In some areas, certificate holders were confused due to the enforcement of similar qualifications.

At that time, except for license or service areas, the qualification system was implemented in the form of a skill test system in accordance with the "Vocational Training Act." Skill tests were divided into academic subject tests and performance tests of the 1st class and the 2nd class. In the test, a person who satisfied specific qualification requirements was exempted, in whole or in part, from academic subject tests or performance tests. In addition, the 1st class skill test assessed the skill level of applicants who had passed the 2nd class skill test and then had several years of practical experience.

A person who completed the required courses in "public vocational training" or "acknowledged vocational training" or had the equivalent qualifications was permitted to submit to a skill test. Those who passed the class 1 and class 2 skill tests received an "Acceptance Certificate" for technicians, could use the title "Certified Technician," and were registered in the "Register of Certified Technicians." The government controlled the use of the title "certified technician." This was part of an effort to improve the social status of certificate holders and give them preference in employment.

With the revision of the act in 1968, the categories of Class 3 technicians, with a low skill level, and Class 4 technicians, with an apprentice skill level, were newly established below Class 1 and Class 2 for graduates of a one-year vocational training course, so the skill test system was reorganized to have 4 classes in total. At that time, for Class 3 and Class 4 only

a performance test was conducted, and the "Certificate of Acceptance" was issued to those who passed the test, which was different from Class 1 and Class 2.

Changes in the industry with successful economic development resulted in the expansion of demand in various areas of qualification. With this change, it became necessary to legislate the operation of the qualification system assessing specialized technicians.

<Table 2-3> shows the numbers of examinees and certificate holders on the national technical qualification. As shown in the table, the cumulative number of examinees for 7 years increased from about 1,400 persons to about 235,000 persons as of 1967, which shows the increased demand of qualification for certified technicians.

Table 2-2 | Competent Department and Qualification Item by Relevant Legislation

Relevant laws (Year of Enactment)	Competent Dept.	Qualification Items within relevant laws
Construction Business Act ('58)	Ministry of Construction	Construction technician (civil engineering) Class A, Class B and Class C Construction technician (construction) Class A, Class B and Class C Construction technician (Machinery) Class A, Class B and Class C
Fire Service Act ('58)	Ministry of Home Affairs	Fire Equipment Technician, Class A and Class B
Cadastral Act ('60)	Ministry of Home Affairs	Detailed measurement and cadastral measurement technician Basic measurement and cadastral measurement technician Expanded measurement and cadastral measurement technician
Control of Firearms, Swords, Explosives, Etc. Act ('61)	Ministry of Home Affairs	Explosives Handling Manager, Class A and Class B Explosive Work Manager, Class A and Class B
Act on Special Measures for Logistics Support: Operation guideline for precision promotion business ('72)	Ministry of Commerce-Industry	Class 1 and Class 2 Precision Measurement Technician
Electricity Business Act ('61)	Ministry of Commerce-Industry	Electricity Chief Technician, Class 1, Class 2 and Class 3 Freshwater Way Chief Technician, Class 1, Class 2 and Class 3 Boiler and Turbine Chief Technician, Class 1 and Class 2

Relevant laws (Year of Enactment)	Competent Dept.	Qualification Items within relevant laws
Electricity Construction Act ('63)	Ministry of Commerce-Industry	Electric technician, Class A and Class B
Motor Bicycle Control Act ('61)	Ministry of Energy and Resources	Motor Bicycle Inspector
Mine Security Act ('63)	Ministry of Energy and Resources	Senior Mine Security Manager
Land Survey Act ('61)	Ministry of Construction	Surveyor, Class 1 and Class 2
Road Transportation Vehicles Act ('62)	Ministry of Transportation	Vehicle Inspection Chief Manager Class 1 Automobile Mechanic
Telecommunication Act (II) ('62)	Ministry of Communications	Wired Telecommunications Technician, Class 1 and Class 2
Radio Waves Act ('61)	Ministry of Communications	Wireless Telecommunications Technician, Class 1 and Class 2 Wireless Technician, Class 1 and Class 2
Industrial Standardization Act ('71)	Industry Promotion Agency	Quality Management Technician
Measurement Act ('61)	Ministry of Commerce-Industry	Surveyor, Class 1 and Class 2

Source: Korean Vocational Training Administration Service, "Change of National Technical Qualification System," 1984, pp. 8~25.

Table 2-3 | Change in the Number of Examinees and Certificate Holders of the Skill Test System

Classification		1967 (reference year)	1967~1973
Academic subject test	Examinee	2,646	37,568
	Certificate holder	1,754	15,116
Performance test	Examinee	1,407	234,997
	Certificate holder	434	107,103

Source: Korean Vocational Training Administration Service, 1986

In this environment, the creation of a Korean qualification system[2] was needed because (1) it was necessary to secure the quality of technology to keep up with the change to an industrial society; (2) it was necessary to suggest the orientation of technical education required by the industrial society; and (3) it was necessary to establish a system for managing technicians.

Table 2-4 | Summary by Period

Classification	Before the enactment of National Technical Qualification Act (1945~1972)	Government's effort to overcome the social environment
Period and Economic Condition	- Japanese Forced Occupation and Independence - Korean War and Emancipation - Economic conditions of the poorest country in the world - Maintaining the economy through international aid - Labor-intensive industry (Import alternatives and light industry)	- Inducing the potential unemployed to participate in industry : Industrializing consumer goods, such as textile, weaving, etc. : Industrial development of consumption type depending on aid - Family planning and promotion of saving
Labor and Human Resource	- Inflow of war refugees - Migration of rural population to city - Excess of simple labor and non-certified labor - Need to foster skilled personnel in the alternate industry	- Technical promotion plan to foster technicians intensively - Enactment of the Vocational Training Act to foster skilled personnel - Vocation training centers and training expenses borne by the nation: - Intensively fostering skilled personnel, driven by the nation
Technical and Educational Training	- Need for an organization fostering specialized technician, in addition to regular courses - Securing infrastructure for technical training : Operation of hardware with international aid : Shortage of personnel for software operation(Need to support the development of human resources) - Establishment of vocational training center	- Promotion of technical education system (One-person, One-skill) : Mobilization of skilled human resources through the promotion of technical education - Cultivating vocational training teachers with the active support of the government
National Technical Qualification System	- Operation of license system in accordance with individual industry act - Proliferation of qualification in the service area - Introduction of certified technician system - Promotion of skilled personnel assisting certified technicians	- Enactment of the National Technical Qualification Act : Encompassing the qualifications present before the enactment - Unification of test organizations

2 With respect to the need for creating a Korean qualification system, it is summarized based on the references by Hae-Sul Jin (1980, Legislative official on national skill qualification from Science & Technology Agency).

Chapter 3

Changes of the National Technical Qualification System

1. The Introduction Period of the National Technical Qualification System (1973~1981)
2. Development Period of the National Technical Qualification System (1982~1997)
3. The Maturity Period of the National Technical Qualification System (1998~2010)

Changes of the National Technical Qualification System

1. The Introduction Period of the National Technical Qualification System (1973~1981)

1.1 Needs in the Introduction Period

The success of the 1st and 2nd Economic Development Plan driven by the government was the result of the strong leadership that was present at that time. With this success, the Korean economy was transformed from agriculture-centered to light industry-centered, and then to heavy chemical industry-centered. In an economy based on heavy chemical industry, a supply of technicians with a much higher skill level is needed. Therefore, the promotional policy for industrial labor focused on the effective supply of technical professionals who could meet the demands of the heavy chemical society. Reflecting this, the scattered qualification systems were unified and operated.

The qualification systems present before the enactment of the National Technical Qualification Act were created and operated by the relevant departments according to the special purposes of individual legislation. As a result, there were several problems, such as overlapping of similar qualifications, insufficiency of preferential treatment for certificate holders, etc. The problems of the qualification system that occurred before the enactment of the National Technical Qualification Act can be summarized as follows:[3]

First, the standards for the operation of technical qualification were not unified under the individual legislations. As a result, public confidence in certificate holders could not be secured. In other words, certificate holders were hardly acknowledged for their

3 Taik-Duek Kim and Jeong-Yoon Cho, 21 century's qualification system, Research Institute for Future Human Resource, 2000. pp. 252~253. Revised and supplemented.

job performance ability in similar qualification areas other than the applicable laws and industries. This led to lower the public confidence in the value of the qualifications.

Second, it caused economic waste from the examinees' perspective. Due to a proliferation of similar or overlapped qualifications, examinees were required to pay cost twice in order to obtain qualification. In other words, even though they had a qualification related to similar works, it was necessary to obtain the applicable qualification in accordance with the individual laws in the event of employment or job transfer.

Third, the preferential treatment given to certificate holders was not sufficient. The legal establishment of preferential treatment for technical qualification in addition to licensed qualifications was insufficient to act as incentive. For this reason, the public was not motivated enough to obtain skill.

Fourth, the systematic interconnection between technical education and vocational training system in the regular course was not sufficient. There was a gap in the course and the level of education between regular academic subjects and practice. This gap affected the qualification system, which failed to induce graduates from regular courses to seek the qualification.

Fifth, the foundation for an ability-oriented society was not established due to a social atmosphere that placed an emphasis on having graduated from a prestigious university rather than attaining specific skills. Confucian ideas deeply rooted in Korea interrupted the realization of an ability-oriented society because they put more emphasis on learning than technology.

Sixth, the number of the countries that could be benchmarked for technical qualification systems was limited. The qualification systems of the U.S. or Japan at that time could not be unconditionally accepted since there was a significant difference between their domestic conditions and ours. There was a limitation on how to benchmark the successful operation of qualification systems in countries with the same social/economic conditions.

Domestic/overseas conditions during the introduction period, considering these problems, can be summarized as shown in <Table 4>.

Table 3-1 | Analysis of Domestic/Overseas Conditions during the Introduction Period

Strength (S)	Weakness (W)
- Strong will of top leader - Public desire for economic development - Nation-driven human resource development policy - Success of the 1st and 2nd Economic Development Plans	- Lack of quality technical personnel - Insufficiency of Korean qualification systems - Non-systematic operation of qualifications

Opportunity (O)	Threat (T)
- Constant international support - Oil crisis and special demands in the Middle East - Low-income labor and human resources	- Limitation on the number of benchmarking countries - Confucian ideas and university-prestige-focused social climate

Through the analysis of domestic/overseas situations, the government introduced the National Technical Qualification System which could maximize the utilization of certificate holders and contribute to the development of national industry. The introduction of this system had the purpose of assigning a specific qualification to those who had reached a specific level in technology and skill, in accordance with the national, unified standard.

Accordingly, with the enactment and proclamation of the "National Technical Qualification Act" on December 31, 1973, the government established the basis for unifying the existing license and qualification tests that were implemented and managed by each department.

1.2 Conditions and Operational Characteristics of Qualification System during the Introduction Period

The National Technical Qualification Act enacted at the end of 1973 unified Korea's diverse qualification systems and stipulated their purpose, definition and exemption standards. Under this act, the qualification systems were divided by the technical area and the skill area, and the authority to implement and set testing for qualification was assigned to the relevant governmental department or the governor of each province.

Subsequently, the "Enforcement Decree of the National Technical Qualification Act" was enacted and promulgated in 1974, and under this Enforcement Decree the national technical qualification system was systematized into 7 grades in total. In addition, with the enactment and promulgation of the "Enforcement Rule of the National Technical Qualification Act," the basis of the national technical qualification system was completed.

The qualifications during the introduction period consisted of 727 items in 19 job areas. The principle used for the selection of national technical qualification items at that time was as follows:[4]

First, items in the area of industrial technology closely related to the heavy chemical industry, such as machine, metal, or chemicals, or other industrial development, should be selected first among the qualification items. These were designated as a priority in order to contribute to the development of the heavy chemicals industry, and to use the national technical qualification system as a means of promoting successful economic development.

4 Taik-Duek Kim and Jeong-Yoon Cho, 21st century qualification system, Research Institute for Future Human Resources, 2000. pp. 295~296. Revised and supplemented.

Second, the qualification items were selected considering the education/training system and their relationship. This allowed the operation of the technical education and vocational training system to be improved.

Third, the qualification items were selected considering the license system that was present before the enactment of the act. In this way, the license systems operated under other laws and rules, such as automobile mechanic and construction worker, were absorbed into the qualification system. Through this, the national technical qualification system was able to absorb and unify the existing qualification systems.

Fourth, qualifications items were selected for which tests were actually feasible in terms of facilities, cost and test technology. In other words, the qualification items whose real benefits could be expected from the perspective of suppliers and consumers were selected. Testing standards for national technical qualification at the time of enactment are as shown in <Table 5>.

In the introduction period, the national technical qualification system rapidly reflected socioeconomic changes as well as the development trend of industries. Various laws and regulations for the establishment of the system were revised several times during this period. In the process, the authority for qualification testing was transferred from the relevant competent department to "Korean Technical Testing Service."[5]

Table 3-2 | Testing Standards for National Technical Qualification by Grade at the Time of Enactment

Sector	Grade	Testing Standards
Technology	Technical Engineer	Candidate should have the ability to carry out technical works such as planning, research, design, analysis, testing, operation, construction, assessment or its relevant instruction and supervision, based on a high level of expertise and practical experience in the applicable technical areas
	Class 1 Technician	Candidate should have a basic knowledge on engineering in the applicable technical area, and the capability of application
	Class 2 Technician	Candidate should have a basic knowledge of the technology in the applicable technical area, and the capability of application

5 'Korean Technical Testing Service,' established in 1976, was formerly the 'Human Resources Development Service of Korea.'

Sector	Grade	Testing Standards
Skill	Master Mechanic	Candidate should have the ability to carry out supervision, such as work control, functional supervision, etc. with the highest level of skilled function in the applicable job area
	Class 1 Mechanic	Candidate should have the ability to carry out directional functions, such as application, manufacturing, production, handling, maintenance, repair, collection, inspection or related works, with a high level of skilled function in the applicable job area
	Class 2 Mechanic	Candidate should have the ability to carry out functional works, such as manufacturing, production, handling, maintenance, repair, collection, inspection or related works, with a middle level of skilled function in the applicable job area
	Assistant Mechanic	Candidate should have the ability to carry out various functional works under the supervision of a person with high-level capability, or as an assistant to such person, based on a low level of skilled function in the applicable job area

Source: Ministry of Government Legislation (2010)

<Table 3-3> summarizes the details of the testing organization for national technical qualification and the test items during the introduction period. As shown in the table, the number of testing organizations, which was 26 in 1977, had been gradually reduced through the transfer to Korean Technical Testing Service, and all tests, except for tests supervised by the Ministry of National Defense, ultimately became supervised by one organization. Even though the Ministry of National Defense and Korea Technical Testing Service seemed to implement tests on the surface, all 439 test items (as of 1981) actually became integrated into the Korea Technical Testing Service because the Ministry of National Defense carried out its test with questions made and issued by the Korean Technical Testing Service.

Table 3-3 | Enforcement Organization for National Technical Qualification Tests and Change of Items

Year	Test Enforcement Organization	Number of Items	Number of Items by Testing Service
1977	26 organizations: - 12 central departments - 11cities/provinces - Korean Technical Testing Service - Korean Precision Device Center - Korea Resources Corporation, etc.	Number of items: 388	Number of Enforced Items: 161 (41.5%)

Year	Test Enforcement Organization	Number of Items	Number of Items by Testing Service
1978	16 organizations: - Ministry of National Defense, Ministry of Culture and Education, Ministry of Communications, Ministry of Labor - Education Committees of 11 cities/ provinces - Korea Technical Testing Service	Number of items: 443	Number of Enforced Items: 334 (75.4%)
1981	2 organizations - Korean Technical Testing Service - Ministry of National Defense	Number of items: 439	Number of Enforced Items: 439 (100%)

Source: Human Resources Development Service of Korea (2002), 20 Years of Human Resources Development Service of Korea, p 112

The operational characteristics of the national technical qualification system in the introduction period were as follows:

First, the legal basis for national technical qualifications was reasonably established under the control of the government, and was constantly revised and complemented according to social/economic change.

Second, based on the enactment and revision of the National Technical Qualification Act, the authority of the relevant departments to enforce and operate qualification tests was transferred to the "Korean Technical Testing Service." Through this transfer, the organizations enforcing national technical qualification tests were unified as one organization, and the foundation for systematic operation was established.

Third, to establish the foundation of a capability-focused industrial society, the government introduced the "Mandatory Testing System."[6] This System was an effort to provide fair treatment to technical personnel by shifting the societal emphasis from academic ability to technical training. In particular, the establishment of vocational training institutes was one such effort to secure skilled technicians according to the policy to promote heavy chemical industry.

Fourth, following the enactment of the Act, the government made active efforts to improve the social status and treatment of certificate holders. In addition, the government promoted an expansion of the practical use of certified technicians in the industrial field, and secured various benefits to guarantee the positions of certified technicians.

6 Refers to the system that graduates-to-be in technical or commercial high school are obliged to apply for national technical qualification.

1.3 Outcomes of the Qualification System in the Introduction Period, and Overcoming Limitations

The outcomes of the national technical qualification system in the introduction period are as follows:

First, it systematized the qualification systems through the enactment of the National Technical Qualification Act. Standards that had been differently applied before the enactment of the act were unified.

Second, it contributed to Korea's economic development by systematizing human resource cultivation and assessment systems through the national technical qualification system.

Third, with the enforcement organizations unified, costs and expenses related to enforcement organizations and examinees were reduced.

Fourth, it prevented unnecessary qualification-seeking efforts, and reduced the money and time burden of examinees through the unified operation of similar/overlapping qualifications.

Fifth, a shift to a new paradigm focusing on capability was achieved through preferential treatment of certificate holders in individual legislations.

Sixth, the conception of Korean society's emphasis on university prestige was improved. Practical education was systematically interconnected with job training in addition to regular courses so that it could connect job training with the qualification system.

Finally, the national technical qualification system contributed to establishing the groundwork for a virtuous cycle of development/supply of specialized personnel in the labor market. In other words, the qualification system acts as a fair assessment on the result of education and training, based on the jobs necessary for each industrial field, and personnel with specific qualifications can continuously contribute to national economic development by fulfilling their own role in the industrial field.

Despite such outcomes, there were a number of limitations in the introduction period of the national technical qualification system. These limitations are described in the following, along with the efforts made to resolve such limitations:

First, the qualification system was operated focusing on simple mechanics rather than the specialized technicians necessary for the change to a heavy chemical society. According to the "Korean Technical Testing Service," 104,417 persons with the technician level, which was considered as specialized technician, were generated in total from 1977 to 1981. On the other hand, the total number of those with certifications as mechanics was 220,253 in. This result shows that specialized technicians could not be developed and generated due to the operation of the national technical qualification system. This insufficient number of the specialized technicians needed for the heavy chemical industry was due to a general

contempt for technical education in regular academic programs. In order to overcome this problem, the government made efforts to promote the system by giving privileges such as providing dormitory for students at mechanical high schools and technical high schools. In addition, it carried out a policy of expanding female human resources by promoting commercial education for females.

Second, the national technical qualification system has limitations in terms of fully transferring Korean society from a university-prestige-centered society into a capability-centered society (Bu-Tae Kim et al., 1995). The "Mandatory Testing System" was finally abolished only after 1 year because more people entered the society with their strong academic background rather than their actual qualifications. This was due to inequality in educational level and treatment after graduation between technicians and individuals attending a particular university. As a result, efforts to reinforce the interconnection among education-training-qualification were made in order to establish a qualification testing method that would secure a consistent skill level among technicians in the same category, and to ensure the integration of the functions of human resources development.

Third, the qualification tests lacked compatibility with vocational training. From a learner's point of a view, both qualification and university prestige show the results of learning. However, flexible compatibility between them was not sufficiently achieved. Thus, from the perspective of a learner, there was a difference between what is learned in school and what is assessed by the qualification system. A learner must make extra efforts in order to resolve these differences. These limitations were due to differences between practical education focusing on performance and academic education focusing on the type of job. To fundamentally resolve this problem, the government implemented item development and arrangement necessary for capital-intensive and technology-intensive industry, and operated a practice-focused qualification system by promoting the participation of industrial experts.

Fourth, since qualifications could not become an alternative to academic background, the original functions of the system could not be carried out. As the qualifications didn't receive public confidence, they failed to meet the expectations of students, workers and entrepreneurs. Accordingly, the national technical qualification system showed its limitations on promoting support actively for the development of vocational capability throughout the society.[7] However, such limitations were overcome by the expansion of technicians focusing on practical training in technical colleges for the development of technicians as well as the mandatory employment of technicians with relevant qualifications.

7 Myeong-Hoon Shin et al, Comprehensive analysis of qualification system and study on improvement, Korea Research Institute for Vocational Education & Training, 1998, revised and quoted.

Table 3-4 | Summary by Period

Classification	Introduction period of the national technical qualification system (1973~1981)	Government's efforts to overcome according to situations
Period and Economic Situations	- Success of the 1st and 2nd Economic Development Plans - Establishing the basis for heavy chemical industry and export industry - Need to promote learning of skills by workers - Segmentation and specialization of industrial structure	- Economic development and promotion of the national psyche through Saemaeul Movement - Arrangement of training to foster specialized personnel, and establishment of orientation
Labor and Human Resource	- Increase of demand in qualified technical personnel - Need to develop skilled personnel in specialized industry - Enforcing obligation of vocational training in the business : Mandatory cultivation of mechanics	- Establishment of compensation for economically stable promotion in all business types of labor - Introduction of job-based pay system - Full-scale introduction of employment insurance system - Export of human resources to overseas market, such as the Middle East
Technical and Educational Training	- Establishment of technical high schools and public vocational training institutes - Opening of technical skills university and 24 public vocational training centers - Establishment of vocational training research center - joining as a member country in the International Skills Olympics - Holding local skills competition	- Expansion of education opportunities for technicians, focusing on practical studies through technical colleges - Promoting mechanical high school and technical high school, and giving privileges - Expanding commercial education to foster female human resources
National Technical Qualification System	- Establishing 'Korean Technical Testing Service' and unifying testing enforcement - Unification into the National Technical Qualification Act - Integrating the qualification items in all industrial areas - Establishing the grade for multi-skill technicians - Reinforcing regulations, such as prohibition of similar and overlapping qualification items	- Establishing the testing method to secure the homogeneity of labor : Development of a plan for interconnecting education-training-qualification - Development and arrangement of items necessary for capital-intensive and technology-intensive industry

2. Development Period of the National Technical Qualification System (1982~1997)

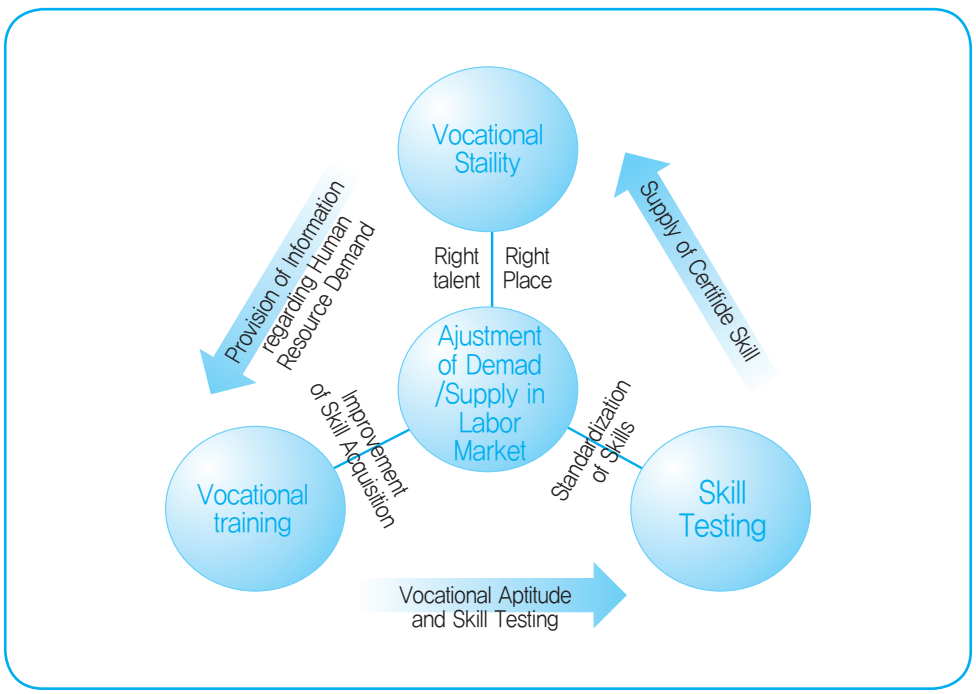
2.1 Demands in the Development Period

After the 2nd Oil Crisis in the 1980s, the global economy showed a strong trend toward low-development and protectionism. Accordingly, the orientation of Korea's economic development policy shifted from external growth to stability, efficiency and balanced-development.

As a result of these environmental factors, the demand for skilled workers in the industrial field was increased. Furthermore, the efficient operation of the national technical qualification system was emphasized in order to supply high-quality skilled human resources to the labor market. In addition, it was necessary to expand the number of highly skilled workers through the systematic post-management of certificate holders and various skill competitions.

Accordingly, the government began to review a plan to integrate vocational capability development training and qualification test operations, which had previously been managed separately, as shown in [Figure 3-1].

Figure 3-1 | Co-relation between Vocational Training and Skill Test [8]

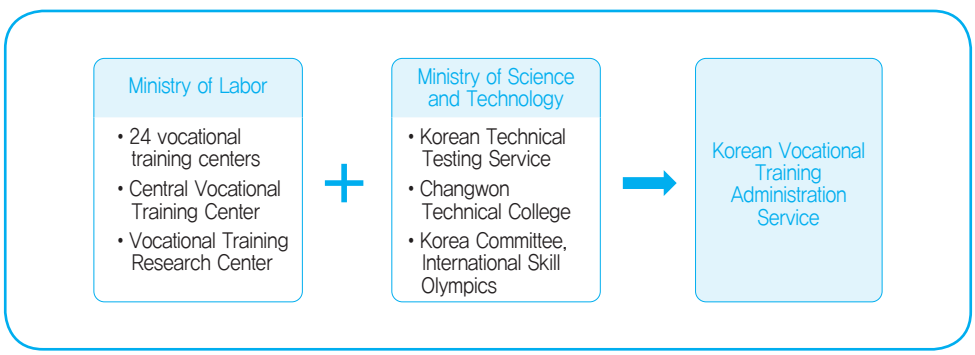


8 Sang-Sun Seo, Footprint of Korea's Vocational Training System, Korea Chamber of Commerce & Industry, 2002. pp 104. quoted.

With the reorganization of the government in 1981, the government changed the department responsible for qualification from the Ministry of Science-Technology to the Ministry of Labor. In addition, the Ministry of Labor expanded and reorganized the "Korean Technical Testing Service" into the "Korean Vocational Training Administration Service" as shown in [Figure 3-2].

The establishment of the "Korean Vocational Training Administration Service" meant the integration of vocational training systems to develop skilled personnel and testing functions under the national technical qualification system into one organization. As a result, it established the human resource management system and institutionalized it to foster and manage skilled personnel that could satisfy industrial needs.

Figure 3-2 | Role of the "Korean Vocational Training Administration Service"



The Korean Vocational Training Administration Service functioned mainly as follows: (1) To reinforce global competitiveness and improve productivity through the development and advancement of elite skill level workers; (2) to induce private-sector-driven human resource development through the vitalization of the private-sector's function of fostering HR; (3) to promote the level of skill through the rationalization of skill tests; and (4) to focus on the smooth demand/supply of human resources through the vitalization of vocational stability by unifying vocational training and qualification tests, to reflect government policies.

By the 1980s, human resources development in Korean was focused on the short-term cultivation and supply of human resources for the development of both the private and the public sectors. This resulted in an insufficient supply of human resources that were capable of coping with the changes in industry flexibly. In addition, it caused an increased imbalance between skill level, technical level and qualification test among training institutes. The internal and external situations of the national technical qualification system during the development period can be analyzed as shown in <Table 7>.

The establishment of the Korean Vocational Training Administration Service was one of policy approaches not only to reinforce opportunity and strength but also to complement

threats and weaknesses through the above analysis on internal/external environments. The integration of functions aimed to foster technicians that could satisfy the needs of the changing industrial society, and to establish a qualification system that granted qualification through fair and rigid assessment.

Table 3-5 | Environmental Elements of National Technical Qualification System in the Development Period, and Analysis of Internal Capacity

Strength (S)	Weakness (W)
- Unified the functions and operations of national technical qualification system - Managed all industries, with the integration of various qualifications	- Inefficient due to diversity of human resource management systems - Inadequate qualification operating system related to service and private-sector - Insufficient in terms of generating the specialized technicians required by the high-tech industrial society
Opportunity (O)	**Threat (T)**
- Transferred outgoing growth strategy into stable balanced development strategy - Success of the 5th Economic Development Plan and Increasing need for human resource development	- Gap between industrial field/level and qualification level - Depression of global economy - Decreased effectiveness of qualification policy due to quantitative growth

2.2 Conditions and Operating Characteristics of Qualification System during the Development Period

With the establishment of the Korean Vocational Training Administration Service, the national technical qualification system was divided and operated by the responsible department, competent departments and implementing departments. The Ministry of Labor, the responsible department, was responsible for the overall qualification system, through legislative revision, establishment of action plans, etc. 18 competent departments, including the Ministry of Home Affairs, the Ministry of Commerce, and other competent departments, were responsible for utilizing the generated personnel in individual businesses. Finally, the Korean Vocational Training Administration Service, an implementing department, carried out matters such as setting exam questions, performing exams, and conducting post-management of certificate holders.

With the establishment of the roles and functions of the Service, the insufficient basis for qualification systems and enforcements was reorganized. In terms of enforcement, questions that were suitable for job practice in the industrial field were developed, and performance test questions were disclosed in advance in order to improve the examinees' practical capability. An item pool was computerized and operated for the systematic management of exam questions.

The assessment method of the test was divided into review of qualification for an examination and an interview in addition to a written test and a performance test. Besides, efforts were made to secure fairness by differentiating questions, such as multiple choice, essay question, practice type, combination type, etc., according to the grade, in order to reflect the characteristics of qualification items.

The grade system was changed to an 8-grade system to reflect the development of advanced industrial technology by placing technicians with multiple skills under the Master Mechanic category in 1995.

Annual testing for qualification was divided into periodic test, irregular test and regular test. Irregular tests were carried out with a focus on the mechanic level only when it was impossible to predict demand for examination or in urgent circumstances. Regular tests were carried out year-round as a service to the public. In addition, to reflect the changes brought about by technical development in industry for the certificate holders' capability, refresher training and effective term of qualification system were introduced.

With respect to the scope of the national technical qualification, which was divided into technical area and skill area, the service area, including office management operated by each governmental organization and private institute, was newly established. The number of qualification items operated during the development period of the national technical qualification system is shown in <Table 8>.

The table shows the process by which the national technical qualification was transformed from a 7-grade into an 8-grade structure. The "Main Events" section describes the specific situations, such as change of job area, etc. Based on the table, it can be induced that the number of qualification items reached about 900 due to the absorption of the service areas, such as the office management area, at the beginning of the development period.

The operational characteristics of the development period for the national technical qualification system are as follows:

First, the "Korean Vocational Training Administration Service" was established and the previous vocational training systems and qualification testing systems were unified. As a result, it was possible to improve the effectiveness of the national technical qualification system, because the Minister of Labor became responsible for the national technical qualification system. This change made it possible to secure a systematic human resource development system that was capable of effectively operating a qualification system that could respond to changes in the economy and the industrial structure.

The details are as follows: (1) Installation of the Technical Qualification System Review Committee; (2) Prohibition of the use of technical qualification names; (3) Prohibition of qualification tests similar to qualification tests by the private sector; (4) Priority recruitment of certificate holders; (5) Disqualification for exam for 3 years in the event of illegal behavior; and (6) Reinforcement of penalty. This meant that the Service reinforced the regulations necessary for qualification testing.

Second, qualifications in the areas of office management and service supervised by each department, in addition to the national technical qualification, were integrated into the national technical qualification. The integrated qualification items were unified as the national technical qualification test carried out by the Korean Vocational Training Administration Service.[9] With this change, the number of items for national technical qualifications was extended to about 900.

Table 3-6 | Change of Qualification Grades and Items in the Development Period [10]

Year	Grade	Number of Qualification Items	Main Events
1983	**Technology**: Technical Engineer, Class 1 Technician, Class 2 Technician **Skill**: Master Mechanic, Class 1 Mechanic, Class 2 Mechanic, Assistant Mechanic	Number of items: 901 Technology: 208 Skill: 693	21 job areas
1984	**Technology**: Same as above **Skill**: Same as above Service area: Master, Class 1, Class 2, Assistant Office Management: Unit, Classes 1 through 5	Number of items 910 Technology: 208 Skill: 673 Service: 21 Office: 29	22 job areas - Separate specification of qualification for exam in the service area - Addition of written exam for Master Mechanic - Outsourcing of office management area to Korea Chamber of Commerce and Industry
1985	**Technology**: Same as above **Skill**: Same as above Service area: Master, Class 1, Class 2, Assistant	Number of items 871 Technology: 235 Skill: 584 Service: 52	22 job areas
1991	**Technology**: Technical engineer, Class 1 Technician, Class 2 Technician **Skill**: Master Mechanic, Class 1 Mechanic, Class 2 Mechanic, Assistant Mechanic Service area: Master, Class 1, Class 2, Assistant	Number of items 904 Technology: 258 Skill: 594 Service: 52	23 job areas

9 Yong Ho SEO, Plan for arrangement of national technical qualification items in office management/service areas, Vocational Training Research Center, 1989, pp 19-21, quoted.

10 Guide on National Technical Qualification Test (1981~1998)

Year	Grade	Number of Qualification Items	Main Events
	Technology: Technical engineer, Class 1 Technician, Class 2 Technician **Skill**: Master Mechanic, Class 1 Mechanic, Class 2 Mechanic, Assistant Mechanic	Number of items 682 Technology: 269 Skill: 413	24 job areas (New creation of craft) - Including service area technology in skill - Establishment of mechanics grade (8-grade)
	Technology: Technical engineer, Class 1 Technician, Class 2 Technician **Skill**: Master Mechanic, Multi-Skill Technician, Class 1 Mechanic, Class 2 Mechanic, Assistant Mechanic	Number of items 705 Technology: 274 Skill: 431	- 8-grade system, with enforcement of testing for multi-skill technician

The advance of industrial technology changed the training system from simple-skill personnel to multi-skill personnel. This change was reflected in the grade system of qualification test, and the 8-grade system was finally completed with addition of multi-skill technician as a technical qualification grade. (Assistant Mechanic, Class 2 Mechanic, Class 1 Mechanic, Multi-Skill Technician,[11] Class 2 Technician, Class 1 Technician, and Technical Engineer)

Third, the mandatory testing system of national technical qualification tests was abolished, in whole or in part. This transformed the direct connection into an indirect connection between qualification and test. For example, it connected qualification with education and training by letting academic experts participate in the enactment and revision of exam standards, the setting of exam questions, etc.

Fourth, it acknowledged the qualifications obtained under other laws as qualifications under the National Technical Qualification Act.

Fifth, it introduced refresher training and effective terms of qualification to secure a better quality of certificate holders. This system aimed to eliminate or resolve the contradiction that the qualification of certificate holders was permanent regardless of job performance.[12]

11 A person who plays an important role as a middle manager positioned between technical engineers in the industrial field and mechanics is called a 'Technician' in English, which is the same as Techniker in Germany, Practical Engineer in Japan and Multi-Function Engineer in Korea (20-Year History of Human Resources Development Service of Korea).

12 Korean Vocational Training Administration Service, History of National Technical Qualification, 1986. pp 44~47.

2.3 Outcomes of the Qualification System in the Development Period, and Overcoming Limitations

The outcomes of national technical qualification system in the development period were as follows:

First, with the establishment of the "Korean Vocational Training Administration Service," a comprehensive management system was started, covering vocational training, qualification test, international skills competition, etc. Based on this foundation, the service expanded, establishing branch offices, beginning with 13 branch offices, for the convenience of local examinees. The expansion of local branches provided an opportunity to transform the previously supply-centered national technical qualification testing into consumer-centered national technical qualification testing.

Subsequently, the system for qualification tests was integrated through computerization. This system attempted to provide a variety of information, such as examination questions, grading system, post management, etc.

Second, the national technical qualification came to encompass whole industries by integrating the previously scattered service and office management qualifications in addition to technical and skill areas. The unified standard for examination improved economic feasibility for Korea and its people by standardizing similar qualifications, overlapping qualifications and separate individual qualifications.

Third, a refresher education system was introduced as an attempt to secure the quality of certificate holders and disseminate new technologies. This system contributed to the viability of the national technical qualification system, keeping pace with social change and industrial change. The effective term of qualification provided the basis for unifying the grade system by integrating the qualifications in the existing service and office management areas and technical areas under individual laws into a comprehensive grade system of national technical qualification.

Fourth, the mandatory test system, which had been enforced for the purpose of establishing a connection between education, training and qualification, was abolished. Accordingly, a new standard for assessment was established, including theoretical knowledge in the educational field and practical experience in the industrial field. The new standard for assessment applied to the test methods, including training standards and question standards.

Despite these outcomes, there were limitations to the national technical qualification system during the development period, and various efforts were made to resolve these.

First, the national technical qualification system was somewhat rigid due to its operation by the government. The government-driven qualification system lacked flexibility to be able to rapidly reflect sharp changes in demand. This caused a gap between the level of qualification and the level of field demand, which would not be able to satisfy the actual expectations

of the rapidly changing industrial field. Due to a lack of participation by members of the private sector, such as various professional institutes, job-related associations, industries, and the like, the gap between the level of qualification and the level of field demand was not decreased (Jeong-Pyo Lee, 1998). To overcome these limitations, the government divided the qualification system into public-sector qualification and private-sector qualification for the purpose of meeting various qualification demands according to the development of industrial society. In addition, the nation recognized the public confidence in qualifications carried out by the private sector. Furthermore, it made efforts to reflect the needs from the field and overcome problems through the diversification of performance tests and the publication of questions.

Second, due to the operation of manufacturing-focused qualification items, it was impossible to establish the conditions to operate various qualifications suitable for developing trends, such as the private-sector-centered service industry, the IT industry, etc. (Jin Han BAE, 1997: Education Innovation Committee, 1996: Tae-Gi Kim et al, 1996: Tae-Hwa Jeong et al, 1998). These limitations could be resolved by rearranging the framework of qualifications, such as by integrating the dichotomous qualification system (technology and skill) into the service area. In addition, promoting IT industries at the national level could develop Korea's information technology and show its strong aspect as a powerful country of Internet industry.

Third, the abolition of the system of refresher training and effective terms of qualification prevented the qualification system from playing a leading role in introducing new technologies as well as securing the quality of qualifications. The refresher training system was established to actively operate qualifications in response to changes in industry and society. However, due to insufficient expertise in the system or unethical operation by commissioned organizations, it was finally abolished. Also, refresher training was abolished due to its cost and time inefficiency from the perspective of certificate holders. To fill the gap left by the abolished system, various education services, such as lifelong education or e-learning, were constantly provided. However, it is necessary to revive the refresher training system from the perspectives of researchers as well as users, to ensure the effectiveness of the qualifications and reflect the trend of technical changes.

Table 3-7 | Summary by Period

Classification	Development period of the national technical qualification (1982~1997)	Government's efforts to overcome according to situations
Period and Economic Situations	- Success of the 5th Economic Development Plans - Development of capital-intensive industry - Promotion of stability and prosperity - Necessity of advancement/ reaching elite skill level	- Connection of education-training-qualification according to the advancement of skill level, and establishment of a plan for operational promotion - Establishment of economic policy according to demand of the service industry
Labor and Human Resource	- Increased need for specialized technicians - Establishment and adjustment of new job types other than heavy chemical industry - Promotion of job security policy - Increase of employment in the service area with boom of industry for domestic demand	- Preferential recruitment policy for certified technicians - Regulation of technical qualification (similar and overlapping qualifications) - Promotion of demand/supply of service human resources through recognition of private qualifications
Technical and Educational Training	- Training course to foster high-level skilled personnel - Abolition of training course for Assistant Mechanic - Industrial-academic cooperation course and training course for incumbents - Establishment of Skills Development Center - Commencement of a program for fostering vocational trainers	- Expansion of public training centers to foster specialized technicians - Enhancement of training level by grade according to the advancement of industry - Establishment of a system for fostering master mechanics
National Technical Qualification System	- Establishment of Korean Vocational Training Administration Service - Addition of service areas in areas of technology and skill - Introduction of refresher training and qualification renewal system - Establishment of irregular test system - Computerization of item bank and operation of qualification information system	- Legislation of the scope of qualification for responding to various demands on qualification - Additional efforts of service areas reflecting global industrialization and IT industrial demand - Reinforcement of internal efforts for customer needs and satisfaction

3. The Maturity Period of the National Technical Qualification System (1998~2010)

3.1 Demands in the Maturity Period

Entering the 1990s, the Korean Vocational Training Administration Service revised the "Act on the Korean Vocational Training Administration Service" to expand and complement the roles of the qualification system along with the acceleration of changes in industry. The name was changed from "Korean Vocational Training Administration Service" to "Human Resources Development Administration Service of Korea." Subsequently, it was changed to its current name, "Human Resources Development Service of Korea," in December 24, 1994.

In 1997, Korea entered the regime of IMF administration due to the economic crisis caused by a shortage of foreign exchange reserves. Accordingly, the government promoted reorganization in the public and private sectors to resolve the national crisis, which led to mass unemployment. To resolve this mass unemployment crisis, the government promoted the irregular test system in the area of qualification. In addition, it began reinforcing the assessment function of vocational ability development for the unemployed, and made efforts to build a one-stop service system connected with the employment promotion program.

The development and dissemination of IT (Information Technology) resulted in significant changes around the world. The economic and social structure in Korea was transformed into a knowledge-based society based on knowledge and information. The source of national development and wealth shifted from tangible elements, such as land or capital, to intangible elements, such as knowledge, information or creativity.

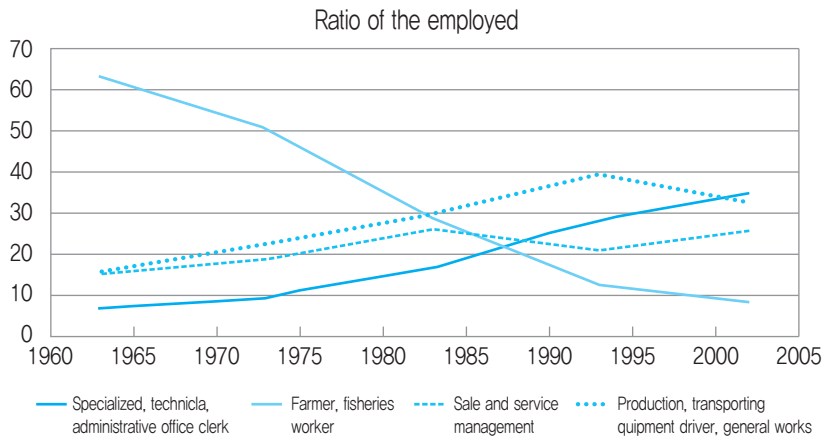
Such environmental changes affected the items of qualification tests. With the development of knowledge-based industry, qualification items for which demand had been increased, such as vocational counselor, society analyst, multimedia contents developer or game planner, were newly established. In addition, in recognition of the fact that national competitiveness would be closely related to human resources development, Korea began promoting the "One Worker, Two Qualifications" campaign to provide knowledge workers with a convenient way to obtain qualification.

In terms of the labor market, the unemployment rate following the financial crisis in late 1997 was recorded as 6.8%, and the increased rate of the employed was recorded as-5.3%, indicating a significant decrease of available labor. In particular, the number of mechanics, machine handling workers and simple workers was most significantly decreased, and there was a decrease of 1 million workers in such fields in 1998 compared to the previous year.

This indicated that the employment crisis most significantly affected workers in the field of manufacturing.[13] However, as shown in [Figure 3], the demand for specialized personnel was increased with economic development and the advancement of the industrial structure.

13 Ministry of Labor, History of labor administrative affairs, 2006, pp 140~145. organized.

Figure 3-3 | Trend of the Ratio of the Employed[14]



This change of the situation in the industrial field led to the simplification of classifications for more flexible operation of the national technical qualification system, as well as the reorganization of the legislation system for more effective management and operation of private qualifications under the Framework Act on Qualification. <Table 3-8> shows an analysis on the direction of policy on qualification systems during the maturity period according to the needs of the times.

Table 3-8 | Environmental Elements of the National Technical Qualification System in the Maturity Period, and Analysis on Internal Capacity

Strength (S)	Weakness (W)
- Reinforced the roles of the Human Resources Development Service of Korea (vocational training, encouragement of skill, overseas employment, etc. in addition to qualification testing) - Flexible operation of the qualification system through simplification of classification and readjustment of grade - Securing of excellence in facilities, equipment and infrastructure	- Insufficient encouragement to employ certificate holders - Insufficient generation of technicians in service areas and specialized areas in the advanced industrial society - Insufficient exploration of qualification in the comprehensive and macroscopic aspects

14 Ministry of Labor, History of labor administrative affairs, 2006, pp 144. Date re-edited.

Opportunity (O)	Threat (T)
- Strengthening of qualification functions for lifelong vocational ability development - Strengthening of positioning and leading functions of qualifications for resolving domestic difficulty in employment - Possession of online and offline network capability	- Gap between the contents of vocational training and the required capability in the industrial field - Insufficient response to the change in service industry due to manufacture-oriented skill/technology - Increased need for cyber university and remote education due to IT development

3.2 Conditions and Operational Characteristics of Qualification System during the Maturity Period

The change in the labor and economic environment due to the financial and foreign exchange crisis forced the National Technical Qualification Act to be revised. For flexible operation of the national technical qualification system, the previous classification of national technical qualifications-technology area, skill area and service area – were abolished. Accordingly, the grade system of job areas was simplified from 8-grade to 5-grade, integrating the areas of technology and skill.

The history of changes in qualification items during the maturity period is shown in <Table 3-9>. With the shift from an 8-grade system to a 5-grade system in 1998, the number of qualification items reached 597 in total (97 items for technical engineer, 33 for master mechanic, 100 for technician, 131 for industrial technician, 204 for mechanic and 32 for basic office management).

The grade which was most sensitive to the change in the social environment and the development of industry was that of mechanic. The change of the number of qualification items in the grade of mechanic was made because of several reasons. First, with the shift of Korea's industrial structure from manufacturing-centered industry to knowledge-intensive industry, the number of mechanics oriented toward the manufacturing industry was significantly decreased. Second, if the specialized technicians were demanded, the lower-level qualification could be integrated into the upper-level qualification. Third, several qualifications were abolished due to the obsolescence of certain industries and jobs with the development of society.

Table 3-9 | Change of Items for National Technical Qualification

Year of Revision / Grade		2002.4	2003.11	2004.12.	2005.5	2005.11	2008.3	2008.11
Sum		622	637	575	574	582	586	556
Technology/ Skill Area	Sub-total	586	601	541	540	548	552	522
	Technical Engineer	97	99	90	89	89	89	89
	Master Mechanic	33	33	28	28	28	28	28
	Technician	104	110	109	109	111	112	105
	Industrial Technician	138	142	122	122	124	125	116
	Mechanic	214	217	192	192	196	198	184
Service Area	Sub-total	36	36	34	34	34	34	34
	Basic Office Management	19	19	16	16	16	16	16
	Specialized Office Management	17	17	18	18	18	18	18

The operational characteristics of the national technical qualification system in the maturity period are as follows:

First, through promoting the private sector's participation in the government-centered operation of the qualification system, the government encouraged mutual supplementation and development of national qualifications and private qualifications, and enacted and promulgated the "Framework Act on Qualification" to suggest the standards for management and operation of the national qualifications.[15] This aimed to resolve the problems caused by the government-driven operation of the qualification system. The government-driven qualification system failed to flexibly respond to the rapid quantitative and qualitative changes in qualifications demanded in the work world. The flexibility problems caused by the government's operation of the qualification system had the following reasons:

① With respect to the operation of the system, there was a lack of the flexibility needed to promptly reflect the rapid changes and demands in the field and field-orientation of qualification test level, test items and assessment method.

15 Taik-Duek Kim and Jeong-Yoon Cho, 21 century's qualification system, Research Center for Future Human Resource, 2000, PP 321~324, arranged and quoted

② The supplier-oriented qualification system failed to sufficiently reflect consumer opinions, and thus there was not enough focus on the field due to a lack of active participation by professional associations, industries and private sector companies.

③ The qualification system requiring a connection between education and jobs failed to fulfill its own functions and to provide a mutual connection between qualifications and university prestige.

④ The qualification system was insufficient in terms of quality due to the diversity of subjects implementing the qualification system and the introduction of a competition system.

⑤ The qualification system was inadequate in terms of operation to suit the global trend of common applicability of qualifications and the developmental trend of service industry.

These problems led to a change of the overall qualification system.

Second, the "National Certificate System for Private Qualifications," in which the nation certified the systematically operated private qualifications was enforced. Previously, the government prohibited the operation of tests that were the same as or similar to the national qualification tests. However, the government allowed the private sector to operate its own qualification system that was directly connected to the life, safety and health of the public.

The introduction of a certified private qualification system had the purpose of promoting the qualification system, enhancing public confidence and fostering the high-quality and diverse personnel demanded by industries. In addition, it was one of the government's efforts to shift Korean society from a university-prestige-focused structure to a qualification-capability-focused structure by increasing the effective value of qualifications.

Third, in terms of the deregulation of enterprise activity, Korea abolished the mandatory provisions regarding refresher training and 5-year effective term that had been introduced during the development period. Accordingly, the mandatory refresher education was shifted to voluntary refresher training carried out by industries as well as the certificate holders, and the effective term system was also abolished.

Fourth, while regulations based on the relevant laws were mitigated during the maturity period, the penalties for the illegal use or certificate rental were reinforced. In particular, both the person renting a certificate and a person lending it became subject to penalty. In addition, to resolve the problems that might occur due to a large-scale shortage of human resources, the government introduced "System for Designating the Number of the Successful Candidates," with which it set the number of applicants to be passed and then carried out the test.

Fifth, with respect to the operation of the system, the qualification system was shifted from a supplier-centered structure driven by the government to a consumer-centered structure. The transparency of the qualification tests was reinforced through the enforcement

of irregular exams, the provision of a qualification system using Q-Net, the publication of written exam questions, disclosure of the exam standard, etc.

Finally, the government attempted to reorganize the qualification system based on National Competency Standards (NCS). NCS, which suggested the competency needed by workers in the industrial field, was utilized for the reorganization of the qualification items, arrangement of exam standards, setting exam questions, etc.

3.3 Outcomes of the Qualification System in the Maturity Period, and Overcoming Limitations

The outcomes of the national technical qualification system in the maturity period are as follows:

First, the name of "Human Resources Development Administration Service of Korea" was changed to "Human Resources Development Service of Korea" to actively cope with the new changes in the environment.

Second, the government flexibly responded to the changes in industrial society by reorganizing the system and item of the grade. In particular, by abolishing the technology area and skill area, it ensured smooth transfer among the grades.

Third, the previous refresher training system was revived through the educational training system. The government constructed a lifelong education system for certificate holders by shifting from the mandatory system enforced in the development period to a voluntary system. A refresher training system is a must for the enhancement of national competitiveness and the development of individual ability. Construction of a voluntary learning system and the introduction of a credit acknowledgement system enforced during the development period were carried out as a part of efforts to promote certificate holders' will to learn and to reinforce the connection between education and qualification.

Fourth, Korea promoted the reorganization of the system based on the developed information technology. It promoted the efficient operation of the system and increased user convenience through the disclosure of exam standards using Q-net, the construction of "New Item Pool System" from the existing item pool system, etc.

In addition, it provided precise statistical data on the qualification test through the computerization of information regarding certificate issue and examinees. In this way, it could build an efficient system for the post-management of certificate holders by utilizing the personal information of certificate holders. Computerization satisfied users' right to know, and Human Resources Development Service of Korea could secure precise statistical data through the qualification test system. Securing statistical data made it possible to suggest promising qualifications through a precise prediction of future demand for qualifications and promising industries.

Fifth, the government promoted the constant improvement of institutions according to the changes in the industrial environment. As a result, the National Technical Qualification

Act was revised 8 times, its Enforcement Decree 26 times, and its Enforcement Rule 21 times by the end of 2010. This indicates how flexibly the qualification system responded to the rapidly changing society and the changes of the economy and the labor market.

The constant development of the qualification system led to a new turning point through the development of "National Competency Standards (NCS)." The interconnected operation of the job-vocational training-qualification system through National Competency Standards (NCS), and the reorganization of the qualification system with a focus on industry utilizing the National Competency Standards (NCS), will become a task to be carried out by the qualification system of Korea.

The reorganization of the grade system of the national qualification system carried out during the maturity period significantly contributed to the transformation of a supplier-centered exam system into a consumer-centered exam system. However, such outcomes had the following limitations, so the government made the following efforts to resolve them:

First, the grades and standards for the qualification test focused on academic learning, rather than field-focused capability. In other words, the exam questions mainly consisted of the contents learned from training institutes or schools, which resulted in a gap between the training provided and the field-oriented knowledge required by industry. In particular, the alleviation of qualifications for exams through the rearrangement of the grade system caused a degradation of public confidence specific to qualification.

Second, with the acknowledgement of tests in similar majors due to deregulation, limitations in the system's operation were revealed when there was a mass production of certificate holders, regardless of their majors. The mass production of certificate holders curtailed the usability of qualifications. The limitation on the usability of qualification resulted in abolishing the permission for taking exams in similar majors, designating and operating the relevant department by law through the reinforcement of restrictions on qualifications for exam.

Third, as the amount of development of National Competency Standards (NCS) is only 30%, the reorganization of the qualification system utilizing NCS has some limitations at this time. NCS should construct a National Qualification Framework (NQF) that is capable of connecting school education, vocational training and the qualification system. In addition, it must be able to show a vertical and horizontal relationship among each qualification, and suggest compatibility among the qualifications by indicating the individual's capability. As a solution, the government is simultaneously enacting new standards and revising the existing standards through the development of a job competency standards package.

Fourth, the scope of operation of the National Technical Qualification Act was set with a focus on the areas of technology and skill. The current industrial structure has been shifting to a knowledge-intensive and service-industry-centered structure, but the qualification items in the service area account for only 5%. In order to eliminate the perception that

the national technical qualification system was composed of items focusing on "simple skills," it is necessary to expand the qualification items to the service area. Thus, Korea is making efforts to develop qualifications in the service area so that it can promote the participation of social partners in each section and connect the qualifications with the level of job competency essential to the field.

Finally, there is limitation on the treatment of certificate holders. Various supporting plans have been suggested since the introduction of the national qualification system. However, it was found that all of these treatments are short-term and microscopic economic supports. Thus, with respect to improving the treatment of certificate holders, preferential treatment in personnel affairs should be provided in addition to actual economic preference for the promotion of the qualification system. Some companies have established and operated their own preferential treatment for certificate holders. To disseminate this practice to all industries, the government has been enacting the relevant laws.

Table 3-10 | Summary by Period

Classification	Maturity period of the national technical qualification system (1998~present)	Government's efforts according to the situation
Period and Economic Situation	- Situation of global open economy : FTA - IMF financial crisis and mass unemployment - Economic development in IT field - Deregulation	- Creation and maintenance of jobs to resolve unemployment - Organization of labor market in response to the change of the industrial structure - Support and protection of social minorities
Labor and Human Resources	- High-level specialized technicians - Human resource policy available globally - Need for specialized personnel in the service industry	- Connection of education-training-qualification in the area of service industry - Fostering new intellectuals and improving the employment ability of technicians - Construction of an information system for the labor market
Technical and Educational Training	- Need for training courses to resolve unemployment - Lifelong education according to the advancement of academic study - Training for incumbents - Course for re-employment and vocational training for seniors	- Connection of education-training-qualification through the development of NCS - Reinforcement of internal stability of vocational training, seeking efficient support - Reinforcement of the competitiveness of incumbents and development of vocational ability

Classification	Development period of the national technical qualification (1982~1997)	Government's efforts to overcome according to situations
National Technical Qualification System	- Reorganization of 5-grade system - Diversification of testing technique - Easing of qualifications for exam - New establishment of qualification items in service area - Commissioned testing for specialized qualification items	- Securing flexibility of qualification through abolition of classification of technology/skill areas - Vertical/horizontal entry of qualification through the change of qualifications for exam - Promotion of 'One Worker, Two Qualifications' project

Table 3-11 | Comprehensive Summary

Stage	Period and Economic Situations	Labor and Human Resource	Technical and Educational Training	National Technical Qualification System
Before the enactment of National Technical Qualification Act (1945~1972)	- Japanese Forced Occupation - Korean War - Economic situation of the poorest country in the world - Economy receiving international aid - Labor-intensive industry (Industry focusing on alternatives of imports)	- Inflow of war refugees - Migration of rural population to city - Excess of simple labor and non-certified labor - Need to foster skilled personnel in alternate industries	- Need for an organization fostering specialized technicians, in addition to regular courses - Securing the infrastructure for technical training : Operation of hardware with international aid : Shortage of personnel for software operation (Need to foster the development of human resources) - Establishing vocational training center	- Operation of license system in accordance with individual industry act - Proliferation of qualification in the service area - Introduction of certified technician system - Promotion of skilled personnel assisting certified technicians

Stage	Period and Economic Situations	Labor and Human Resource	Technical and Educational Training	National Technical Qualification System
Introduction Period of National Technical Qualification (1973~1981)	- Success of the 1st and 2th Economic Development Plan - Development of heavy chemicals industry and export industry - Need to promote the acquisition of skill by workers - Segmentation and specialization of industrial structure	- Increasing demand for quality technical personnel - Need to develop skilled personnel in specialized industry - Creating obligation of vocational training by businesses : Mandatory development of mechanics	Establishment of technical high schools and public vocational training institutes - Opening of technical skills university and 24 public vocational training centers - Establishment of vocational training research center - Subscribing to the International Skills Olympics - Holding local skills competition events	- Establishing 'Korean Technical Testing Service' and unifying the testing enforcement - Unification into the National Technical Qualification Act - Integrating the qualification items in all industrial areas - Establishing the grade for multi-skill technicians - Reinforcing regulations, such as the prohibition of similar or overlapping qualification items
Development Period of National Technical Qualification (1982~1997)	- Success of the 5th Economic Development Plan - Development of technology-intensive industry - Promotion of policy for stability and prosperity - Need for advancement and developing technicians with elite skill level	- Increased need for specialized technicians - Establishment and adjustment of new job types other than heavy chemical industry - Promotion of job security policy - Increase of employment in service areas with industrial boom for domestic demand	- Training course to foster high-level skilled personnel - Abolition of training course for Assistant Mechanic - Industry-academic cooperation course and training course for incumbents - Establishment of Skills Development Center - Commencement of a program to foster vocational trainers	- Establishment of Korean Vocational Training Administration Service - Addition of service area to the areas of technology and skill - Introduction of refresher training and qualification renewal system - Establishment of irregular test system - Computerization of item bank and operation of qualification information system
Maturity Period of National Technical Qualification (1998~ Present)	- Opening of global economy - IMF financial crisis - Development of IT economy - Deregulation	- High-level specialized technicians - Human resource policy available globally - Need for specialized service industry personnel	- Need for training course to resolve unemployment - Lifelong education course according to the advancement of academic study - Training for incumbents - Course for re-employment and vocational training for seniors	- Reorganization of 5-grade system - Diversification of testing techniques - Easing qualifications for exam - New establishment of qualification items in service area - Commissioned testing for specialized qualification items

Chapter 4

Current National Technical Qualification System

1. Operation System of the National Technical Qualification System
2. Grade of the National Technical Qualification System and Qualifications for Exam

Current National Technical Qualification System

1. Operation System of the National Technical Qualification System

Since the enactment of the "National Technical Qualification Act," the national technical qualification system has undergone many changes. To assess the operation of the current national technical qualification system, it is necessary to comprehensively review the various qualification systems being operated in Korea.

The current qualification systems in Korea can be divided by the leading administration, as shown in <Table 4-1>. The qualification systems in Korea can be divided into national qualifications and private qualifications. Under the Framework Act on Qualification, a "National Qualification" is defined as the "qualification that a nation establishes, manages and operates in accordance with the applicable laws" while a "Private Qualification" is defined as the "qualification that any entity, other than a nation, establishes, manages and operates (Ministry of Government Legislation, 2010)."

Table 4-1 | Classification and s Status of q Qualifications in Korea (As of June 2010)

Classification		Number of Items	Relevant Laws	Enforcement Organization
National Qualifications	National technical qualifications	556	National Technical Qualification Act (Ministry of Labor)	17 departments (7 organizations)
	Other national qualifications	131	Individual business laws	22 departments/ agencies/ committees (67 Organizations)

Classification		Number of Items	Relevant Laws	Enforcement Organization
Private Qualifications	Certified private qualifications	87	Framework Act on Qualification (Ministry of Education)	11 departments (46 organizations)
	Registered private qualifications	1,250	Framework Act on Qualification (Ministry of Education)	About 440 organizations
	Enterprise qualifications	85	Workers Vocation Ability Development Act	44 businesses

Guide on National Technical Qualification Testing (Human Resources Development Service of Korea, 2010), Q-net (Human Resources Development Service of Korea, 2010), Private Qualification Information Service (Korea Research Institute for Vocational Education & Training, 2010), etc.

"National qualifications" can be divided into "National technical qualifications" and "Other national qualifications." "National technical qualifications" are qualifications in areas of technology or skill, such as technician or mechanic. "Other technical qualifications" are qualifications that a nation newly establishes and operates under the relevant laws, such as lawyer or doctor.

"Private qualifications" can be divided into "Certified private qualifications," "Registered private qualifications" and "Enterprise qualifications." "Certified private qualifications" are qualifications that a nation recognizes in accordance with the specific procedure and method. "Registered private qualifications" are the qualifications that are registered with private qualification registration organizations. "Enterprise qualification" refers to the qualification that an entrepreneur newly establishes and operates for the vocational development of workers.

Specifically, the current status of operational purpose, operational system and commissioned organizations of national technical qualification system are as follows:

The purpose of operating the national technical qualification system is "to develop the vocational ability of technical personnel and to contribute to Korea's economic development, as well as to elevate the social status of technical personnel through the establishment of a qualification system that can meet the demands of industry (Ministry of Government Legislation, 2010)."

National technical qualifications are jointly operated by "a comprehensive organization for operation of institution," "an organization for utilizing certificate holders," and "an

organization for carrying out qualification." The Ministry of Employment and Labor, which manages the National Technical Qualification Act, is responsible for the overall operation of the system.

Each competent department, such as the Ministry of Education, Science and Technology, the Ministry of Knowledge Economy, and the Ministry of Land, Transport and Maritime Affairs, is responsible for utilization of certificate holders. In addition, organizations such as Human Resources Development Service of Korea, the Korean Chamber of Commerce & Industry, and others, carry out the work related to qualification tests, such as setting exam questions, establishing exam plans, testing, certificate issue and post-management, as requested by the competent departments. The structure of operation of national technical qualification is as shown in [Figure 4-1].

The number of qualification items enforced as of the end of 2010 in accordance with "National Technical Qualification Act" is 556. Such qualification items are enforced by the Human Resources Development Service of Korea, the Korean Chamber of Commerce and Industry, the Korea Institute of Nuclear Safety, the Korean Film Council, Korea Creative Content Agency, the Korea Communications Agency and the Mine Reclamation Corporation. The current status of commissioned organizations for national technical qualification is shown in <Table 4-2>.

Figure 4-1 | Structure of Operation of National Technical Qualification

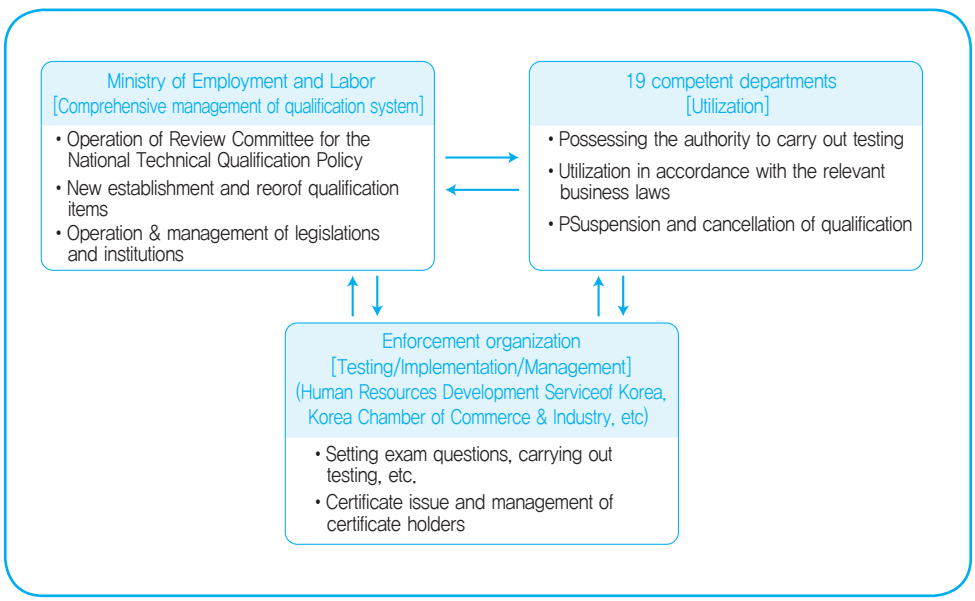


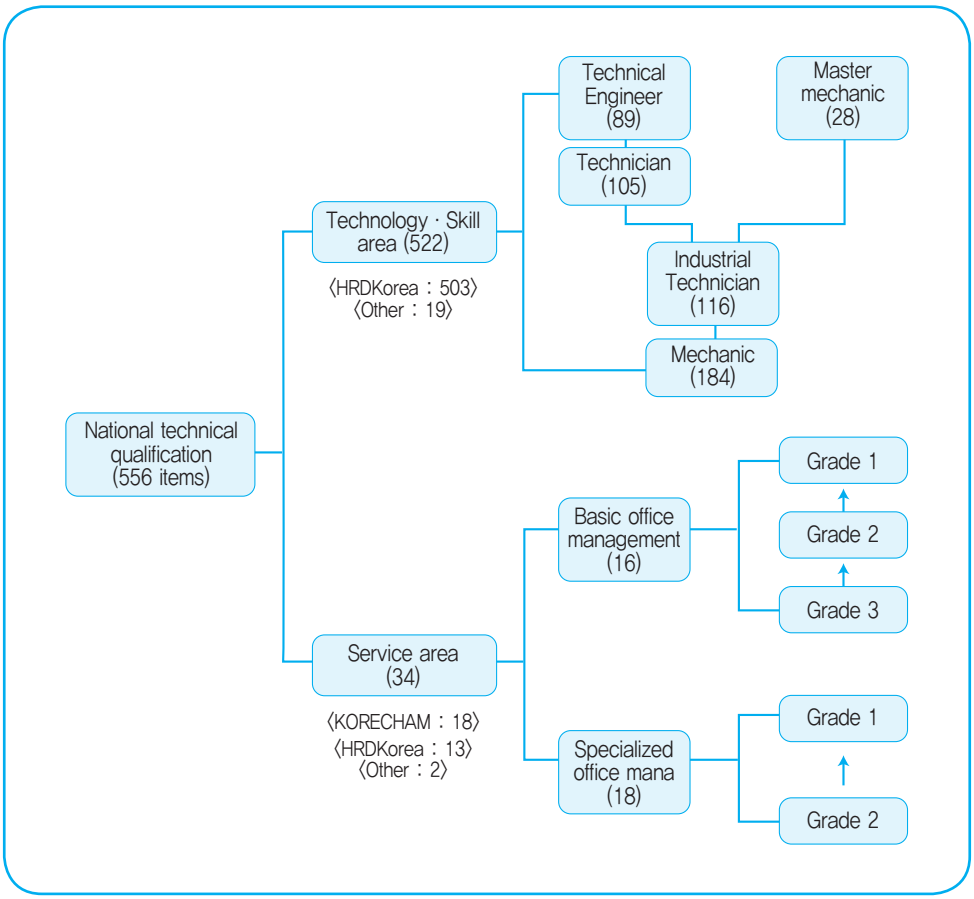
Table 4-2 | Current Status of Commissioned Organizations for National Technical Qualification

Name of Organization	Commissioned Items	Year of Commissioning
7 organizations	**556 items**	
Human Resources Development Service of Korea	Construction mechanic, welding Technician/ master mechanic, industrial technician, mechanic, metal inspector (516 items)	-
Korea Chamber of Commerce and Industry	Word processor Grades 1, 2 and 3, Computer literacy Grades 1, 2, and 3, E-commerce administrator Grades 1, 2 and 3 (18 items)	-
Korea Institute of Nuclear Safety	Nuclear power engineer, Radiation control technician, Nuclear technician (3 items)	2008
Korean Film Council	Projectionist, Projection mechanic (2 items)	2009
Korea Creative Content Agency	Game planning expert, game graphics expert, game programming expert (3 items)	2010
Korea Communications Agency	Radio-wave communication technician/industrial technician/mechanic, Radio-wave electronic technician/industrial technician/mechanic/ Wireless equipment technician/industrial technician/mechanic/Broadcasting and communications technician/industrial technician/ mechanic (12 items)	2010
Mine Reclamation Corporation	Mining hazard prevention technician/ mechanic (2 items)	2010

2. Grade of the National Technical Qualification System and Qualifications for Exam

The current grade system of national technical qualifications in Korea is composed of 5 grades in the areas of technology and skill and 1~3 grades in the area of service. There is a structure in which lower grade certificate holders can advance to higher grades, as shown in [Figure4-2].

Figure 4-2 | Grade System of National Technical Qualification
(As of the end of 2010)



Source: Basic Plan for the Development of National Technical Qualifications (2010).

In addition, the qualifications for exams are designated in consideration of academic background and career. The government has established and operates a variety of paths for acquiring qualifications, such as acquiring qualifications based on academic study, acquiring qualifications based on similar qualifications, acquiring qualifications based on career in the industrial field, etc. The qualifications for exams are shown in <Table 13>.

Table 4-3 | Qualifications for National Technical Qualification Exam

Grade	Qualifications for exam			
	Holder of technical qualifications	Graduates from related departments	Graduates from unrelated departments	Generally experienced person
Technical engineer	- Technician +4 years - Industrial technici-an +6 years - Mechanic +8 years - Holder of foreign certification for the same item	- University graduate +7 years - 3-year college graduate+8 years - 2-year college graduate +9 years - Completion of training course equivalent to the level of technician(industrial technician) +7 years (9 years)	- University graduate +9 years - 3-year college graduate +9 years - 2-year college graduate +10 years	- 11 years
Master mechanic	- Industrial technician + 6 years - Mechanic +8 years - Holder of foreign certification for the same item	- Completion(or expected completion) of the master mechanic course in skills training college after acquiring industrial technician or mechanic qualification in the same job area	Same as the left	- 11 years
Technician	- Technician in the same area +1year - Mechanic +3 years - Holder of foreign certification for the same item	- University graduate (expected graduate) - 3-year college graduate +1 year - 2-year college graduate +2 years - Completion of training course equiva-lent to the level of technician - Completion of training course equiva-lent to the level of industrial technician +2 years	- University graduate +2 years - 3-year college graduate +2.5 years - 2-year college graduate +3 years	- 4 years
Industrial technician	- Industrial technician in the same area - Mechanic +1 year - Holder of foreign certification for the same item	- College graduate (or expected graduate) - Completion of training course equivalent to the level of industrial technician	- University graduate - 3-year college graduate + a half year - 2-year college graduate +1year	- 2 years
Mechanic	- No requirements			
Basic office management	- No requirements			

Chapter 5

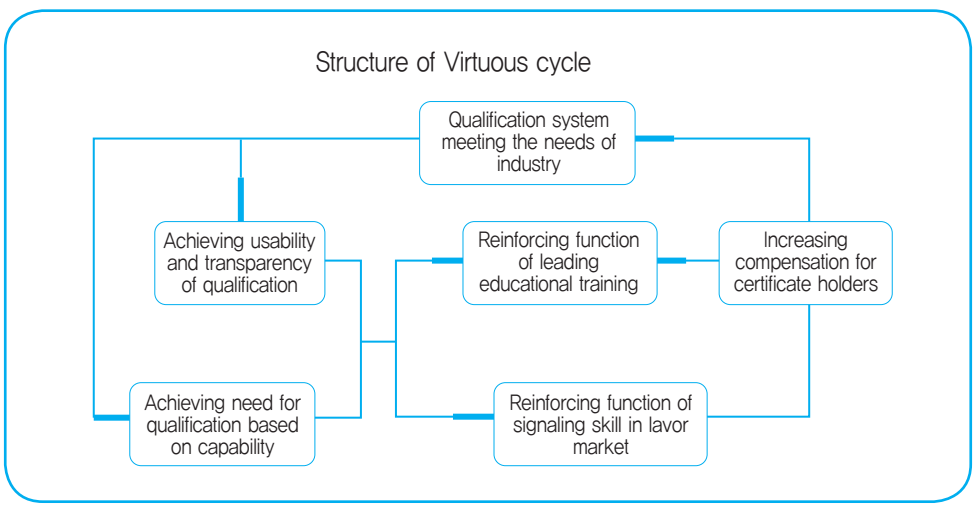
Necessity and Role of National Technical Qualification System

1. Necessity and Roles from the Perspective of the Individual
2. Necessity and Roles from the Perspective of the Corporation
3. Necessity and Roles from the Perspective of the Nation

Necessity and Role of National Technical Qualification System

The national technical qualification system is organically connected with the needs of industry, the contents of educational training, compensation for certificate holders, etc. The purpose of the qualification system is to lead the improved quality and skilled technology of certificate holders by reinforcing the field-orientation of industry. Its ultimate purpose is to provide high-quality labor to companies that need labor. This virtuous cycle of qualification contributes to improving job ability and increases the applicability of qualifications so that the labor force can satisfy the needs of industry. In addition, it attempts to contribute to the realization of a capability-centered society by supporting the reasonable and systematic management of human resources. The virtuous cycle of the qualification test system is shown in [Figure 5-1].

Figure 5-1 | Virtuous Cycle of Qualification Test System



Source: Soon Hee KANG, Vision and Development Plan for Qualification System, Korea Labor Institute, 2003

The necessity and roles of the national technical qualification system will be examined as follows, from the perspective of the individual, the corporation and the nation.

1. Necessity and Roles from the Perspective of the Individual

From the perspective of the individual, the necessity and roles of the operation of the national technical qualification system are as follows:

First, it functions as a signal that objectively shows the levels and types of job performance capability related to job ability. The signal function of qualification promotes the acquisition and improvement of capability through the education and training of the individual. In addition, qualification plays a role in leading the development of a career path through vertical hierarchy. It can lead to lifelong learning and individual development by suggesting the future vision of an incumbent.

Second, it can improve the quality of employment for the worker that obtains national technical qualification. In particular, it can have the result of replacing university prestige by enabling the worker to enter into the labor market with only the individual's capability.

Third, it can establish conditions under which individuals can work in new occupations or industries with the obtained qualification. For an individual who has entered the labor market based on his/her university's prestige, rather than his/her aptitude or specialty, if the individual finds an aptitude or specialty through the process of obtaining qualification, it is possible to assess such individual's potential for job transfer or re-employment based on the formulated standards depending on his/her level of developed capability.[16]

2. Necessity and Roles from the Perspective of the Corporation

From the perspective of the corporation, the necessities and roles of the operation of national technical qualification are as follows:

First, it can reduce costs in the area of human resources management. It ensures that costs can be saved in the areas of recruitment, employment, education and placement in office, assessment, and compensation by employing a nationally certified, high-quality labor force.

Second, it can resolve information discordance in the demand/supply of labor force. Because assessments of workers prior to the employment are made based on sectional evaluation of his/her academic background and career, these cannot guarantee complete job

16 Chang-Gyo Seo, Analysis on the effect of national technical qualification, 2000. pp 64. quoted

competency. In this regard, qualification provides precise information on the job capability level in terms of job-seeking and recruitment.

Third, it can utilize a labor force that has acquired new technologies by reflecting the changes of industries and jobs that have occurred due to changes in the domestic/international environment in the national technical qualification system. By absorbing the changes in industry into the qualification system by newly establishing or changing the qualification items, it plays a role in leading the technical power of the labor force.

3. Necessity and Roles from the Perspective of the Nation

From the perspective of the nation, the necessities and roles of the operation of the national technical qualification system are as follows:

First, since the enactment of the Act, the national technical qualification system has contributed to the development of the national economy through the connection of job-training-qualification. It has fostered human resources with new technologies and specialized technologies/skills, based on the needs of the times.

Second, it established the structure of vocational ability level from a national perspective. It unified the standards for each technical qualification item, and supplemented and improved the framework of qualification according to the level and type of vocational ability. It established a basis for a unified national technical qualification system, which had been operated diversely.

Third, it reduced the costs related to national human resources management. Since national technical qualifications are publicly recognized, they are used in the selection of public officials, the education of the labor force, placement, assessment and compensation. These functions significantly contribute to eliminating any waste in human resources management.

Chapter 6

Recommendations and Implications

1. Design and Operation of the Government-Driven Qualification System
2. Qualification Grade and Development of Items with the Change of Economic Development
3. Installation of Comprehensive Organization for Operating Qualification System
4. Incentive to Certificate Holders
5. Establishment of a System for Refresher Training and Effective Term of Qualification
6. Organization of Information Infrastructure for Operation of Qualification System
7. Securing a Research Function

Recommendations and Implications

1. Design and Operation of the Government-Driven Qualification System

In benchmarking foreign qualification systems, it is necessary to consider the domestic conditions of the society, the economy and the labor market. This is because no matter how well a system may be operated, there is a high risk of failure if it lacks adequate infrastructure.

Since the early days of its economic development, Korea has managed and operated a government-driven national technical qualification system. As a result, it was able to supply the technical personnel necessary for industrial development from 1960 to the late 1990s. The reasons for the success of the national technical qualification system are as follows: (1) it was designed as a qualification system meeting the needs of the socioeconomic environment of the times; (2) the government had a strong will to foster technicians and mechanics; (3) efforts to utilize certificate holders in the industry were made; and (4) pan-national participation.

The characteristics of the operation of a government-driven national technical qualification system are as follows:

First, it is possible to operate legislations and institutions necessary for the settlement and stability of the national technical qualification system.

Second, it is easy to construct various infrastructures for operating the national technical qualification system. For the settlement and stability of institutions, the construction of infrastructure related to facilities, equipments and devices should be carried out under the leadership of the government.

Third, it is possible to reduce the socioeconomic costs involved in the operation of the national technical qualification system. If the government does not make efforts for the settlement of the institutions, it may cost twice and be waste of resource.

Fourth, the operation of a government-driven national technical qualification system made it possible to supply the technical personnel that industry required on a large scale and in a short period of time. The development of education and training curricula driven by the government can contribute to the fostering of technicians and mechanics through qualification.

On the other hand, the operation of a government-driven national technical qualification system may have the following limitations:

First, there is a limitation on the system's capacity to respond flexibly to changes in situations, such as industrial change, or change related to demand/supply of labor force, because the operation of the institution was based on legislation. The hierarchical and rigid operation of the system driven by the government may decrease the flexibility of institutional operation.

Second, insufficient participation of industries or related institutes may lead to a decline of the field-oriented nature of the applicable qualification. Qualification is based on a virtuous cycle that reflects the demands of industry and fosters the applicable human resources. Thus, it is necessary to operate a national technical qualification system that reflects the demands of industry.

Third, the establishment of a qualification system and the operation of an institution that is dependent on the government may restrict the participation of the private sector in the qualification market. This may deteriorate the quality of qualification due to an overload of organizations enforcing the qualification system. In addition, due to excessive regulation by the government, the private sector's capability of operation may be restricted.

Now, Korea is promoting a transition from a government-driven qualification system to a private-sector-driven qualification system. A transition from technology-intensive industry to technical convergence and knowledge-intensive industry with the economic development is needed because of the demands of the times. In the process of benchmarking, a developing country should determine whether a qualification system should be operated under the leadership of its government or the private sector considering its actual circumstances.

2. Qualification Grade and Development of Items with the Change of Economic Development

Since the enactment of the Act in 1973, Korea's national technical qualification system has been constantly changing, in order to supply certificate holders with adequate job competency and skill in changing industries and occupations.

In 1998, Korea's national technical qualification system was changed from an 8-grade system to a 5-grade system in response to various socioeconomic changes. The most significant characteristic of the change at that time was the integration of the technology area and the skills area. Also, by continuously promoting new establishment and arrangement of national technical qualification items, it now operates 556 items in 26 job areas as of the end of December 2010.

The characteristics of qualification grade and development of items with the changes in economic development are as follows:

First, a grade system was set that was suitable to the needs of industry and that would enable workers to develop a lifelong job ability. Korea operates a 5-grade system. However, European countries and other countries operate 7-grade or 8-grade systems. Thus, it is important to develop a grade system that is suitable for the specific country.

Second, Korea led the human resources development which was necessary to reinforce its national competitiveness by continuously developing qualification items related to new technologies and new industries. The demand for human resources will vary depending on the times and the improvement of technology level.

Third, it adjusted the demand/supply of human resources by integrating the qualification items whose level of applicability had been decreased into a similar qualification, or by abolishing them. Thus, the qualification system should be operated so that it can cope with newly established jobs as well as integrated/abolished jobs.

In terms of qualification grade and development according to the period of economic development, the following should be considered:

First, Korea could mass-produce certificate holders unrelated to the vocational abilities actually used in the field due to the diverse paths to the acquisition of national technical qualification. It should be able to secure the effectiveness of qualification by establishing an effective term system or refresher training system.

Second, the establishment of new qualifications with competency levels and details that were overlapped in some points may increase the number of certificate holders holding similar qualifications. Segmentation of industries and jobs requires the establishment of new, but similar jobs. However, qualifications that can be integrated or converged may establish a procedure for objective assessment through opinions from the field and qualified experts.

Third, an excessive number of qualification items may decrease the efficiency of post-management of certificate holders from an operational perspective. Thus, it is necessary for a nation to determine and operate the adequate number of qualification items through an analysis of industry.

3. Installation of Comprehensive Organization for Operating Qualification System

It is necessary to have a comprehensive organization managing the national technical qualification system in order to construct it as a framework at the national level. This is because the selection and the operation of the comprehensive organization are a shortcut to the early settlement of the qualification system.

It is desirable to promote the selection/operation of the comprehensive organization through legislation. Legislation should include the details of the comprehensive organization for operating the qualification system, as well as the operational framework or method of improving the qualification system.

The organization and operation of a comprehensive organization for national technical qualification has the following advantages:

First, it enables the demand from industry and the adoption of new technologies to be systematically reflected. A comprehensive organization should select an adequate qualification item and provide it to the public by continuously observing industrial and vocational change.

Second, it enables the field-orientation and applicability of qualifications to be increased by unifying a path between consumers and suppliers of such qualifications. The operation of a qualification system through a comprehensive organization can ensure a more prompt response to changes in demand and supply.

Third, it enables the consistent management and operation of the level of qualification available in each department and in business law. The comprehensive organization provides a valid qualification level adequate to the level and type of jobs determined by the government.

Fourth, the installation of a comprehensive organization can enhance public confidence in national technical qualifications and reinforce their applicability and availability. Thus, the operation and implementation of a national technical qualification system by a comprehensive organization can ensure reliability and representativeness.

On the other hand, the operation of a comprehensive organization for national technical qualification has the following limitations:

First, if there is insufficient participation by industries, it cannot promptly cope with the changes in the industrial environment.

Second, the operation of a qualification system led by a comprehensive organization can decrease in participation by consumers who utilize certificate holders.

Third, it may distort the qualification market due to discretionary operation of the system. As a result, the comprehensive organization's discretionary operation of qualification may not reflect the demand of users and the qualification market, restricting the usefulness and applicability of the qualifications.

4. Incentive to Certificate Holders

To ensure an adequate supply of the personnel needed by industry, it is necessary to lead high-quality personnel to the qualification market. The most powerful method of inducement is the provision of an incentive to certificate holders. It is difficult to develop a qualification

system without an incentive to certificate holders, no matter how well the framework of the qualification system is organized and constructed.

Providing incentives related to qualification offers the following advantages:

First, it is possible to increase the applicability of the qualifications by leading high-quality personnel to the qualification market. In addition, it allows the establishment of the status of qualification, and increases the value of the qualification.

Second, a national technical qualification can be utilized in employment, promotion, compensation, etc. as a certificate of vocational ability. A certificate can be used as an index for assessment of technical personnel by suppliers and consumers because it certifies the holder's job competency.

Third, incentives for those with academic background can support the realization of a capability-centered society by leading personnel wishing to go into the world with their academic background to the qualification market. Giving an incentive makes it possible to lead high-quality personnel to the qualification market through a variety of means.

When giving an incentive to certificate holders, special attention should be paid to the following matters:

First, the rental of the certificate by the certificate holder should be prevented. This is because an unqualified person may enter an industry or get a job through illegal rental of a national technical qualification.

Second, it is necessary to foster a consensus among businesses, labor unions, etc. on giving incentives to certificate holders. This is because a labor-management problem may occur due to inappropriate treatment between non-certificate holders and certificate holders

5. Establishment of a System for Refresher Training and Effective Term of Qualification

In Korea, refresher training for the holders of national technical qualifications has been carried out since 1984. The purpose of the refresher training system is to oblige certificate holders to receive refresher training following a specific period after their acquisition of qualification, in order to maintain their job competency. However, this system was abolished in 1999 in accordance with the government's deregulation, but was revived due to its necessity.

The system for refresher training and effective term of qualification offers the following advantages:

First, it is possible to periodically convey knowledge and technical changes in the industrial field. Periodic refresher training can promote the development of lifelong ability and provide an opportunity to obtain new technology and knowledge in the changing industrial society.

Second, it is possible to secure the effectiveness of national technical certificates by setting an effective term of certificates. If an individual wishes to maintain his/her qualification, he/she can do so through constant learning and developing job competency. Otherwise, he/she will ultimately fall behind.

However, there are some limitations on refresher training and effective term of qualification, which are as follows:

First, it may cause inconvenience to certificate holders to compel them to regularly participate in refresher training. Such inconvenience should be considered from the perspective of the individual as well as from the perspective of cost and time.

Second, it may cause an increase of cost due to the need to prepare facilities/equipment and educational programs. It is necessary to consider potential cost increase related to constant improvement and maintenance, in addition to the cost for refresher training, from the perspective of the supplier.

6. Organization of Information Infrastructure for Operation of Qualification System

The construction of a qualification information infrastructure is a very important element in operating a qualification system. Since the establishment of "Korean Technical Testing Service," Korea has made efforts to computerize its testing operations, predicting an increase of qualification testing demand. Accordingly, it constructed the qualification information system for the comprehensive management of qualification information.

The construction and the operation of a qualification information system offer the following advantages:

First, it is possible to continuously monitor the usefulness of qualification in the field. Through this, it is possible to maintain a virtuous cycle for the national technical qualification system. In addition, it is possible to create developmental orientation and derive future policy regarding the qualification system, based on information DB.

Second, a database on the national technical qualification holders may be used to improve the efficiency of the qualification system through systematic management. It is possible to analyze the usefulness of qualifications by identifying a path of certificate holders' entry into and movement in the labor market.

Third, it is possible to increase user convenience by providing examinees with information on qualification. The operation of the qualification system based on IT may increase users' convenience and make it possible to construct an interactive system that can share information with users.

In the construction and operation of the qualification information system, special attention should be paid to the following:

First, the database on the holders of national technical qualifications should be managed thoroughly managed. In particular, it is necessary to establish legal regulations related to security and the prevention of personal information exposure.

Second, constant investment is necessary to keep the contents of the qualification information system up-to-date. In addition, the government's constant support is necessary for coping with the development of information technology and maintaining an efficient information system.

7. Securing a Research Function

It is necessary to conduct an overall study of the qualifications in order to improve the effectiveness of the operation of the national technical qualification system. A study on qualifications should be promoted from a mid-term and a long-term perspective, considering changes in the domestic/overseas environment. Since such study should be carried out in the overall qualification system, the operation of a separate research organization is not efficient.

Securing a research function related to qualification may bring the following advantages:

First, it is possible to actively respond to various environments related to qualifications. Thus, it is necessary to conduct a study meeting such requirements by investigating the orientation of human resources management based on the national policies.

Second, it is possible to carry out performance analysis and feedback on the operation of the qualification system. Performance of a study should not just be limited to the result of the study itself, and the applicability of the result should be considered as a priority. For this purpose, it is necessary to plan and implement an actual study on pending issues, and conduct a study for expansion in the mid-term and long-term.

When securing a research function related to qualification, special attention should be paid to the following:

First, it is necessary to encourage diverse stakeholders to participate when conducting research, in order to secure the objectivity and feasibility of a study.

Second, it is necessary to construct a structure for the quality management of the performance procedure of a research subject and its contents. The validity of research performance as well as the interim and final result should be reviewed and proven by various stakeholders from the planning stage.

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