Journal of Asian Vocational Education and Training
Vol. 10, pp. 27-43, 2017

ISSN 2005-0550

Rethinking the Goals of Korean Vocational High Schools based on Expertise Development Models

Nur Atiqah Raduan*, Seung-Il Na
Vocational Education and Workforce Development
Institute of Agricultural and Life Science
Seoul National University, Korea

**Corresponding author: atiqahrad@snu.ac.kr*

ABSTRACT

In Korea, the main goal of vocational high school education is to train students to become skilled workers or to produce a workforce with adequate competencies to enter skilled occupation. However, as of today, the term "skilled-worker" is still remained ambiguous as it has not been examined thoroughly. Hence, by using expertise development models, this article aims to embark on a deeper inquiry regarding the goals of vocational high school education in Korea by analyzing literature related to professional expertise development and vocational high schools in Korea. In the future, it is essential to expand the goals of vocational education in order to shift the focus to the development of a holistic skilled worker. Moreover, the "skilled-worker" that is being studied needs to be defined clearly. Moreover, an education system that considers the expertise development stages of a skilled worker is essential to achieve these expanded goals.

Keywords: Vocational high school, expertise development models, skilled worker, curriculum development, Korea

INTRODUCTION

Continuous shifting labor demands in several industrialized countries have prompted their governments to place an emphasis on the establishment of a lifelong vocational education system and active promotion of vocational education. Similarly, in Korea, the shift to technology-intensive industries in the early 1970s has led to a high demand for skilled workers. This increasing demand has paved a way for the extensive expansion of vocational high schools including specialized vocational high schools and Meister high schools as well as for vocational colleges, polytechnic, and universities (Na, 2012; Park & Jang, 2014). The national expansion of the vocational high schools, in particular, was not only aimed at strengthening the school-industry linkage, but also to reflect the demands of the workplace in the school curriculum and to equip the students with skills relevant to the workplace (Na, 2012). Currently, the level of education attained by an individual plays a pertinent role as an indicator for identifying the level of occupation that is suitable according to their skills. For instance, vocational high school education is categorized under the Level 3 of International Standard Classification of Education. An individual possessing education equivalent to the ISCED Level 3 corresponds to the skill Level 2 of the International Classification Standard of Occupation (ICSO).

One of the main problems of vocational education in Korea is a blind assumption that all graduates of vocational high schools are the actual “skilled workers” that are needed by the labor market. In addition, the continuous technological changes have triggered rapid changes in the workplace, job tasks, as well as the skills required to accomplish these tasks. Taking these factors into consideration, although the goals of vocational education are being cited numerously in vast documentation and literature, there are still a number of questions that require attention such as: “Who is a skilled worker?” “Could the skilled worker, in reality, be trained through high school education?”

In brief, this article attempts to explore the goals of vocational high school education and the notion of skilled worker development in Korea based on the models of expertise development. The expertise development models refer to stage by stage acquisition of skills through continuous practice and experience of a worker in a workplace ─ after entering a job. According to the Dreyfus and Dreyfus' (1980) model of skill acquisition, the expertise development levels can be grouped into five categories: novice, advanced beginner, competent, proficient and expert. To achieve the aim of this article, literature related to professional expertise development from ERIC Database on ProQuest platform and google scholar were examined, while documents on vocational high schools in Korea from various research institutions were reviewed and investigated.

The implication of expertise development models for workforce development

Skill acquisition and expertise development models were introduced in the late 1960s, and they focused on the developmental trajectories from a novice to an expert (Kuchinke, 1997; Dall'Alba & Sandberg, 2006). The five-stage skill acquisition model was proposed by Dreyfus and Dreyfus (1980) and it is widely cited and applied model in workforce development studies. According to Dreyfus and Dreyfus (1980), skill acquisition can be divided into five stages: novice, advanced beginner, competent, proficient and expert. The progression of an individual from one stage to the other is based on the changes in quality of the three attributes (see Table 1) namely, the knowledge-representation, situational awareness, as well as the degree of emotional involvement (Dreyfus & Dreyfus, 1980).

Table 1: Stages of skill acquisition

Descriptive attributes	**Stages**					**Applied domains**
	Novice	**Advanced beginner**	**Competent**	**Proficient**	**Expert**	
Degree of contextuality in knowledge use	Rely on abstract and context-free rules	Begin to recognize similarities across context	Able to recognize patterns deviation	Prominent use of know-how	Deep tacit and implicit knowledge	**Nursing** (Benner, 1984; Benner, Tanner & Chesla, 1996) **Teaching** (Berliner, 1996) **Management** (Worthy, 1996) **Social Work** (Ryan, Fook & Hawkins, 1995) **Programming** (Campbell, Brown & DiBello, 1992; Chimiel & Loui, 2004)
Situational Awareness (SA)	Little or no SA	Little SA but see situation as fragmented task	View fragmented situation analytically	View situation holistically and analytically	View situation holistically and intuitively	
Degree of emotional involvement	Detached from feeling responsibility	Feelings of inadequacy and responsibility	Excessive emotional detachment affects performance	Balance of emotional involvement and detachment	Non-detachment, take full responsibility	

Source: Dreyfus and Dreyfus (1980)

An important concept of expertise development is that, although the possession of knowledge could drive the progression of an individual from the novice to advance beginner level, expertise could only be obtained through years of experiential learning and continuous deliberate practice (Feltovich, Prietula & Ericsson, 2006). Hence, the provision of appropriate learning and training programs would enable an individual to accelerate learning through the trajectory (Lajoie, 2009). On a similar note, the lack of practice and a period of non-use of skills, or the provision of training which are not suited to the individual's level of development may result to a backward regression of skills or what is known as the Expertise Reversal Effect (Kalguya, 2007). The conceptualization of the expertise development has advanced greatly throughout the years, and varied researchers have described the development based on different attributes (Blunden, 1996; Kuchinke, 1997). To summarize the advancement, in the past, the expertise development models (see Table 2) focus on the progression of cognitive dimensions, such as efficient retrieval of knowledge and skills of individuals and professionals as well as increasing automation, and development of an individual on a linear trajectory (Feltovich et al., 2006).

However, recently there has been an argument that these contemporary expertise development models put excessive emphasis on the mere achievement of expert individual who is highly efficient in their performance but does not fully account for the dynamism of expertise and the achievement of a holistic individual (Dall'Alba & Sandberg, 2006; Kinchin & Cabot, 2010; Moon, You & Kim, 2013). In the current globalized world, jobs and professional domains are subjected to swift changes due to the rapid formation and decaying of knowledge. There is also a changing demand of skills due to the volatility of labor market. This further increases the need to shift the focus from a mere attainment of the expert level to the improvement of the expertise (Moon, You & Kim, 2013).

Thus, in recent years there has been a shift in the focus of the expertise development models from the mere attainment of expert level toward an expanded focus of attaining and continuously maintaining and improving expertise for the development of a holistic individual and a "complete human being" (see Table 2). These emerging models emphasize that the mere acquisition of competence or expertise is insufficient. Rather, for individuals to be able to cope in the current world, the expertise development models suggest the integration among the knowledge, skills, attitude, prior learning, culture and social dimensions for holistic human development (Dall'Alba & Sandberg, 2006; Kinchin & Cabot, 2010; Moon, You & Kim, 2013).

Table 2: Shift in the focus of expertise development models

	Contemporary expertise development models	**Emerging expertise development models**
	To achieve expert level	To achieve expert level by improving of expertise
Examples of development models	Model of Zone Proximal Development (Vygoytsky, 1978)	Alternative Model of Professional Development (Dall'Alba & Sandberg, 2006)
	Model of Skill Acquisition (Dreyfus & Dreyfus, 1980)	Integrated Model of Professional Expertise (Yielder, 2009)
	Model of Expertise Development (Fook et al., 2000)	Dual Processing Model (Kinchin & Cabot, 2010)
	Journeyman Model (Hoffman, 2000)	Expertise Development Process (Moon, Kim & You, 2013)
	Model of Domain Learning (Alexander, 2003)	

Taking the aforementioned concepts into consideration, several implications for workforce development can be drawn from the concepts set forth by the expertise development models. This includes the expansion of the goals of vocational high schools, which would not only consider preparing students for the entry level of skilled occupations, but should also consider providing the foundation that would enable them to achieve "fully skilled worker" level that is demanded by the current labor market. Furthermore, the acquiring of "skilled worker" status through the mere attainment of competence is not enough to cope with the current skill demands. Rather, the continuous maintenance and improvement of skills must be taken into consideration during the designing of curriculum, instruction, and more importantly during the selection of the goals of education. Additionally, the levels of development could also be incorporated in the education system, as a guideline for developing curricula or learning instructions.

PAST AND CURRENT GOALS OF VOCATIONAL HIGH SCHOOLS

Historical overview of the goals of secondary vocational education

The expansion of the Korean vocational high schools is paralleled to the development of its economy. One of the main goals was to provide a steady supply of manpower that was demanded during the beginning of the industrialization. In the early 1960, Korea's export-intensive economy which focused on the light industries has caused an increase in the demand of skilled workers *(Dan Neunggong)* (see Table 3). This has led to the active promotion of vocational training as well as the implementation of several laws, more notably the Vocational Training Act 1967 (Ra & Kang, 2012; Park & Jang, 2014). The transition from the light industries to the heavy and chemical industries in 1970 has further increased the demand for skilled workers. The introduction of policies such as the National Technical Qualification Act (NTQA) in 1973, which aimed to cater for the demand, has also consequently expanded vocational high schools and reinforced the vocational training system (Jung, 2007; Na, 2012). As a result of this active nationwide implementation of policies and effective planning of educational programs, universal basic elementary and secondary education was successfully attained by the year 1980 in Korea (Ra & Kang, 2012).

Since 1980s, however, the transition into technology-intensive industries has caused a shift in the skill demand whereby a skilled worker with multiple skills is preferred. This shift in skill demand continued until the 1990s where mere physical labor skills have become less important, and the possession of cognitive skills becomes more valuable (Park, 2011). Hence, the government has started to shift the strategy toward the active promotion of higher education throughout the 1990s (Ryu & Moon, 2015). During this period, the policies which aimed at the expansion of general high schools were implemented at the expense of a reduction in investment in the vocational high school system (Ra & Kang, 2012; Park & Jang, 2014). Despite the decreasing importance of the vocational high schools, they continued to be the main institution for training students for craftsman level (*Kineunggong*) ─ a terminology that a skilled worker is most often referred to (See Table 3).

Table 3: Changes in socio-economic characteristics, direction of policies and curriculum and level of manpower provided by vocational high schools

Characteristics	**1960**	**1970**	**1980**	**1990**	**2000**	**2010**	**2015~**
Core industry and socio-economic characteristics	Labor-intensive and export oriented industry		Technology-intensive Industry		Development of knowledge based society	Shifting toward knowledge-based society with high skills	4th Industrial Revolution and competency-based society
Direction of educational policy	Promoting the vocational education system	Implementation of Vocational Education Act for nurturing workforce development		Implementing laws for expansion of VET	Emphasis on continuing education	Emphasis on "employment first and study later" strategy	Emphasis on national competency standard
Core manpower demanded by industry	One skill (*Dan-neunggong)*		Multiskills *(Da-neunggong)*	Technician (*Cho-geup Kiseul ja)*	Engineer *(Jung-geup Kiseul ja)*	Engineering technologist	Engineering technologist
Level of manpower provided by the vocational high schools	Craftsman *(Kineung-gong)*						
Vocational education curriculum	Textbook-oriented	Experiential learning-oriented	Task-oriented	Job-oriented	Student-centered learning	Competency-based education	NCS-based learning modules

Source: Adapted from Jang, Jeon & Jung (2013)

Current goals of vocational high schools

At the beginning 2000, the expansion of the general high schools and the increasing value of academic attainment in the Korean society, along with a reduction in the investment of vocational high schools has led to a decline in the percentage of student entering the vocational high schools (Ryu & Moon, 2015). In addition, this has created another major issue ─ the mismatch between the demand of skilled workers in the labor market and the supply of workers by the education system, has continued to worsen. Realizing the problem and in an attempt to address it, the government has introduced an educational reform which includes the overall restructuring across the education sector in Korea (Na, 2012; Ryu & Moon, 2015). Under this reform, vocational education is viewed as a lifelong education and is inclusive for all citizens. Moreover, policies that promote vocational high schools, through the introduction of specialized vocational high schools and Meister high schools, were implemented and these are the schools which provide vocational education at higher secondary level (Park, 2011; Na, 2012; Park & Jang, 2014).

Specialized vocational high schools refer to "*schools that provide education to foster workforce in specific areas and experience based education such as field training for students with similar talents, aptitudes, and abilities*" (Article 91-1, Enforcement Decree of the Elementary and Secondary Education Act). Generally, in the first year of vocational high school, all students are obliged to follow the common national curriculum. It is only in the second- and the third-year where the curriculum is differentiated and vocational high school students spend more time in courses that are relevant to their specialization. Furthermore, students also participate in the workplace through an increased cooperation between schools and local employers (Park & Jang, 2014; Moon & Ryu, 2015).

Meister high schools, on the other hand, are categorized as special purpose schools, as dictated under the same decree (Article 91-1) as well as the decree under Article 91-2, the Act for Customized High School based on Industrial Demand (Article 91-2). In Meister high schools, the curriculum is designed according to the industrial needs and this was achieved not only by forming agreements with specific industries, but also by the active involvement of industry experts in the development of the school curriculum (Moon & Ryu, 2015). In a Meister high school, students are exposed to practice or learning in the workplace through company-customized class, cooperative learning and internship with the industry. The major distinction between a Meister high school and a specialized high school is the presence of a stronger industry-academia cooperation in a Meister school than in the latter. This cooperation requires the Meister high school graduates to enter employment upon graduation, rather than continuing their studies. This is in line with the direction of the policies which is to promote the "employment first, study later" strategy (Jang, Jeon & Jung, 2014; Moon & Ryu, 2015).

At a national level, the basic plan of education such as the national educational goals ─ school curriculum contents, methods of delivery, operation and evaluation, are regulated by the Ministry of Education, according to the Article 23-2 of the Elementary and Secondary Education Act. The goal of education is usually reflected in the National School Curriculum disseminated by the Ministry of Education, Science and Technology, whereby a specific set "human characters" (*Ingansang*) is pursued. The most recent curriculum reformation based on the National Competency Standards, was disseminated in 2015. It could be observed that despite the continuous revision of the national curriculum, the *Ingansang* that is pursued lacks major of differentiation. However, in each of the disseminated revised curriculum, the focus of the *Ingansang* has changed throughout the years (see Table 4).

Table 4: Changes in pursued human characters *(ingansang)* as stated in the national curriculum revision

National Curriculum Revision	Pursued "Human Characters" (*Ingansang*)	Focus of *Ingansang*
2007	(1) To cultivate students' sound body and mind while facilitating them to seek their own values and viewpoint in life (2) To use creativity during thinking, reasoning and criticizing (3) To pursue broad-based foundation of knowledge and skills for students' further education and career development according to their own interests and talents (4) To nurture dedication in improving Korean traditions and culture (5) To serve the country whilst nurturing a sense of global citizenship	Nurturing students with a variety of skills needed for the future and educating them with characteristics of global citizenship
2009	(1) To obtain essential skills and attitude needed for lifelong education through learning various knowledge and skills based on a sophisticated self-consciousness and to develop a career fitting to their aptitude and talent (2) To foster critical and creative thinking and attitude that can form new understanding and values from learning and everyday living (3) To acquire ability and attitude to accept various cultures and values, and to enjoy Korean culture (4) To strive for the advancement of the national community and to cultivate students' qualities and attitude as a global citizen	Promoting lifelong learning; nurturing global citizens and while facilitating the students to develop a career appropriate for their aptitude and talents
2015 (Based on National Competency Standard)	(1) To equip students with a mature sense of self-consciousness and character for life-long learning, as well as for students to attain knowledge and skills according to their chosen career (2) To provide opportunity for students to integrate knowledge and experience in various fields, to foster their creative problem-solving as well as to nurture their ability to cope with new situation (3) To nurture students' qualities and attitude that can contribute to the formation of a new culture, through their understanding of humanities and social science, technology and various cultures. (4) To foster students' democratic citizenship qualities and attitude that would allow them to communicate with the world, based on responsibility for the national community	Cultivating an independent, creative, educated individual as well as nurturing the individual to become a global citizen

Source: MEST (2007); MEST (2009); Jang et al. (2013)

At a regional level, within the frame of the national guidelines, the regional department of education develops the standards of curriculum not just based on the regional characteristics, history, tradition, status of industries and society, but it also takes into account the demand and input from the society, citizen and parents. Meanwhile, at a school level, the aim of the school is to establish within the confines the curriculum that it has planned to deliver. For instance, about 63 special vocational high schools specializing in industry and commerce have a common aim to nurture students who will be able to perform craftsman-level jobs (*Kineungsa*) while most specialized vocational high schools in other fields aimed to train a professional talent *Jeonmun inje* (see Table 5). This is similar for Meister high schools, though additionally 12 out of the total Meister high schools aimed to train young Meisters (KRIVET, 2013).

Table 5: The key aims of 470 specialized vocational high schools and 34 Meister high schools in 2013

The aim of school	**Specialized vocational high schools (KRIVET, 2013)**							**Meister high school**
	Agri-culture	**Industry & Commerce**	**Commer-cial Informa-tion**	**Fisheries & Shipping**	**Home Econo-mics**	**Agri-cultural Industries**	**Agri-culture, Home Economics & Commerce**	
Developing professional talent/ competent professional workers (*Jeonmun inje*)	16	43	95	4	27	6	4	6
Nurturing craftsman /functional manpower/expert craftsman (*Kiseulsa/ Kineungsa*)	-	63	4	2	2	-	1	12
Producing competent human resource/leading human resource/ talented human resource/CEOs/ smart talent	8	28	37	-	9	-	2	1
Producing professional and skilled workers *(jeonmun kiseulsa)*	4	37	7	1	4	-	-	1
Imparting necessary knowledge for future knowledge information society	-	3	6	-	-	-	-	-
Developing practice-oriented education	-	-	1	-	-	-	-	-
Cultivating creative talent		12	9		1	2		1
Training core manpower/ industrial manpower	1	4	-	1	1	-	1	-

Developing workforce with global mindset and international competitiveness	3	5	10	1	1	1	1	1
Training students with various qualifications and acquisition of certification	-	-	2	-	-	-	-	-
Training young Meisters	-	-	-	-	-	-	-	12
Total	470							34

CHALLENGES IN THE DEVELOPMENT OF SKILLED WORKERS

Having discussed about the general aims of a vocational high school, another question remains: What exactly does a "skilled worker" refer to? Even the concept of skill is still a perplexing notion, as literature often refers to skill as an equivalent term to "competency", "ability", "capability", and "attribute" (Blunden, 2008). Yet, even without a proper agreement to what entails the concept of skill and skilled worker, the term "skilled worker" is still widely used as the end-product of secondary vocational high school education. In the context of International Standard Class of Occupation (ISCO), skill could generally be understood as the occupational skill that is necessary for the execution of tasks to complete a specific job. Hence, traditionally, under this ISCO context (see Table 6), skilled-occupational levels correspond to the international levels of education or the qualifications acquired through vocational education and training programs (Galobardes, Shaw, Lawlor, Linch & Smith, 2006; Adams & Weakliem, 2011)**.** Consequently, under this context, vocational high school graduates are often referred to as skilled workers.

Table 6: Educational and occupational class indicators

Classification	**Educational class**		**Occupational class**			
Name	Four-factor index of social position (Hollingshead, 1975)	International Standard Classifi-cation of Education (2011)	International Standard Classifi-cation of Occupation (2008)	UK Registrar General Social Class (1990)	Erikson and Goldthorpe Class Scheme (EGP)	Wright Social Class Classifi-cation
Theoretical Background/ Basis	Amount of formal education a person has completed	Recognized educational qualifi-cation a person has completed	Four defined skills levels	Prestige or social standing of occupa-tion	Employ-ment relations	Marxist theory of class
Level	Graduate professional training (graduate degree), Standard college or university,	Doctoral or equivalent level Master or equivalent level	Managers, professionals, technicians and associate professionals Clerical support workers	Profes-sional, Inter-mediate N-skilled non-manual	Higher grade profes-sionals; Administra-tors and ofificials; Managers in large	Capitalists and small employers Petty bourgeoi-sie

	Partial college (at least one year) or specialized training High school graduate (private, preparatory or public school) Partial high school (10th or 11th grade) Junior high school Less than seventh grade	Bachelor or equivalent level Short-cycle tertiary education Post-secondary non-tertiary education Upper secondary education Lower secondary education Primary education Early childhood education	Service and sales workers Skilled agricultural, forestry and fishery workers Craft and related trade workers Plant and machine operators and assemblers Elementary occupation Armed forces occupations	Partly skilled Unskilled Armed forces	industrial establish-ment Lower grade profes-sionals Routine non-manual small proprietors with employees Self-employed without employees Farmers/ small-holders Foremen and technicians Skilled manuals Semi and unskilled manual Agri-cultural workers	Expert managers, Skilled managers Non-skilled managers Expert super-visors Skilled supervisors Expert skilled workers Non-skilled workers

Source: Galobardes, Shaw, Lawlor, Linch & Smith (2006); Adams & Weakliem (2011); International Standard Classification of Occupation (2012); UNESCO Institute for Statistics (2012)

Similar to the international generalization of the term "skilled worker", the level of education and training also directly corresponds to the occupational levels in Korea. The National Technical Qualification Standards (NTQ) represents the set of skills that is required for a variety of occupations (Jang et al., 2014). Thus, vocational high school graduates are qualified for craftsman level of occupation, and this corresponds to the skilled-worker level that is aimed by the Korean vocational high school education (see Table 3). Despite the aforementioned shift in the skill demands, vocational high

schools continued to provide programs which are focusing on preparing students for entry level jobs and for performing tasks which require low level skills. As seen in Table 3, after the year 2010, the core manpower that is needed by the labor market has shifted to technician with field management capabilities (*Suk-leon kiseulja*). This change in core manpower implies that there is less demand for craftsman level skills within the labor market. Furthermore, it also denotes that vocational high schools should also consider equipping students with some skills from the level of engineering technician or *Sukleon cho-geup kiseulja* (see Table 3). In other words, the skilled worker that was mentioned as the goal of vocational high school had in the past referred to as the entry level of craftsman; but now there is a need to redefine the term "skilled worker".

The aim of education at a school level is reflected in its curriculum. As analyzed from the list of specialized vocational high schools and Meister high schools published by KRIVET (2013), the aim of the high school curriculum varies from the training of professional workforce to the training of experts in field for specialized vocational high schools. Table 5 shows the training of young Meisters for the Meister high school. However, despite the coining of these various "terminologies", all could be referred to the training of skilled workforce with skills relevant only for entry level of any employment, rather than the actual attainment of the expertise or professional level in a workplace. Why has this ambiguity in the "skilled worker" arisen? It is mainly due to the lack of interest in the deep inquiry into the term. As can be seen from the stages of curriculum development in each schools (see Figures 1 and 2), each school develops its own curriculum based on the development guidelines provided by the National Curriculum, as well as curriculum guidelines of provincial offices of education. The educational goal of school, the content, strategies, assessment and textbook are regulated by the national curriculum.

The centralization of the curriculum development has been important for Korea's educational controlling. Up until the 5th curriculum, most of the curriculum have been decided at centrally at a national level, while the role of the schools and the teachers was only to implement them (Han et al., 2015). This top-down controlling of curriculum has led curriculum developers (Figure 1) to put too much focus on fulfilling the standard requirements set by the national and regional levels such as fulfilling the minimum guided learning hours. Accordingly, as the national and provincial level curriculum is designed to meet the educational goal of the Elementary and Secondary Education Act, it is widely assumed that the goals of the high school education, would be sufficiently met by placing more weight on following these guidelines. Thus during the preparation stage of the curriculum development, only the analysis of the national curriculum and provincial level curriculum guidelines, as well as analysis of the administration of local department were carried out (see Figure 2). This steps are undeniably necessary in order to meet the national vision but the current excessive focus on these steps could be perceived as serious weakness in the curriculum developmental stages.

In general, to develop students with the needed skills and expertise in various sectors, it requires a deeper engagement of school leaders and teachers as decision makers in developing and practicing the curriculum. Furthermore, the learning needs of the students also require deeper understanding and attention during the preparation stages. This reality, unfortunately, are most often overlooked. Despite the efforts to decentralize the curriculum developments in recent years and the active promotion of the autonomy of regional and school level authorities (Park, 2012), there is still a lack of focus on the school or class level demands during curriculum development. Vocational high school curriculum continues to prepare students to become skilled worker without considering whether the level of the "skilled worker" they has assumed, matches the level of skilled worker that is actually needed upon entering skilled jobs. Inevitably, vocational high school graduates will fall behind the race of employability, due to the skill gap. If this challenges are not overcome, industries will continue to view graduates of vocational high schools as producer of low skilled worker, which would lead to the difficulty in finding job for graduates of vocational high school (Park, 2010)

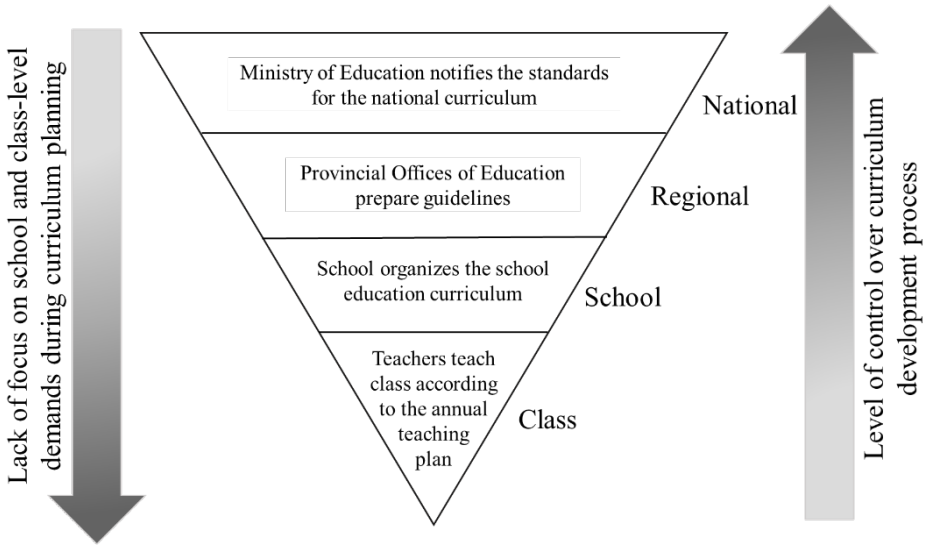

Figure 1: The hierarchy of control of the curriculum development process and its effect on curriculum planning

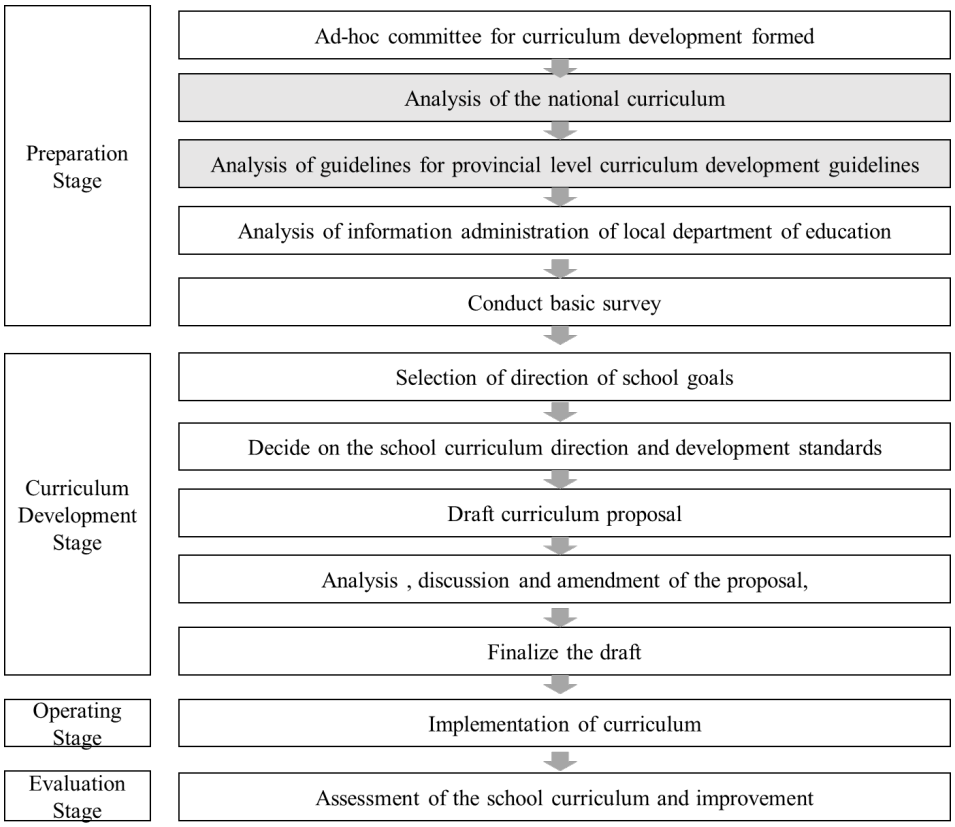

Figure 2: Stages of the development of curriculum
Source: MEST (2009)

SHIFTING FROM "PRODUCT-ORIENTED" TO "PROCESS-ORIENTED" GOALS

As mentioned in the previous section, the primary aim of vocational high school education in Korea is to prepare skilled workers at an entry level. However, in the present globalized world, rapid technological changes have made certain knowledge and skills obsolete. In order to maintain a competitive advantage of the workforce, the policies and curricula of the vocational high schools must respond accordingly. Based on the expertise development models, development should include both the attainment of the skilled worker level, as well as the continuous maintenance and improvement of the skills. Vocational high school education in Korea, however, places too much focus on the "end-product" which is the mere formation of the skilled worker, rather than placing an emphasis on the "process", which is development of a holistic skilled worker that takes into consideration the levels of the skill worker that are needed by the industries. Hence, there is a lack of focus in ― both the development of the appropriate job competencies; and in the nurturing of adaptability of individuals for the changing workplace. Indeed, the provision of basic skills and foundation that is needed for entry level job is important, but without preparing vocational students for their development in the long term, especially in the shifting workplace environment, vocational high school graduates will inevitably fall behind in the competitive race in the world of work. This issue calls for the rethinking of the vocational high school education in Korea ― from the emphasis of end product (formation of skilled worker) to the process (development of holistic skilled worker) (see Figure 3). In other words, the emphasis should be not just on equipping students with specific skills that is appropriate to their choice of vocation; there is also critical to focus on a holistic incorporation of competence.

The emphasis on the skill development has also been mentioned previously at an international level. At the 97th International Labor Conference session in 2008, the ILO has called for a holistic approach to skills development. This includes an emphasis on the provision of continuous pathways of learning as well as providing career guidance, starting from early education, in order to adequately prepare the young generation for secondary and higher education and vocational training. Furthermore, it was also highlighted that the development and the transferability of core skills and higher level skills should be focused on holistic approach. This implies that, in order to achieve a holistic skill development, the educational policies and curriculum must reflect the development of skills from the life cycle perspective: including the building, maintaining and improving of skills.

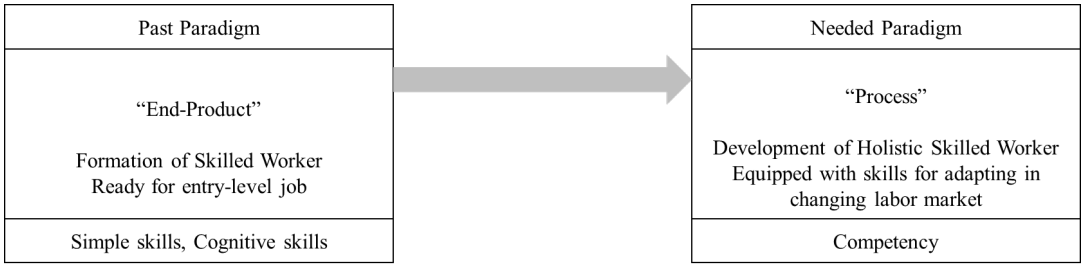

Figure 3: Paradigm shift in the goals of vocational high schools in Korea

In Korea, the shifted goals of vocational education are driven by the introduction of the National Competency System (NCS). The NCS-based curriculum for vocational high schools was first announced in September 2015 and the application of the NCS-based curriculum was launched in March 2016 for 547 specialized vocational high schools and Meister high schools. Furthermore, as of 2016, the NCS-based learning modules that was developed amounted to 847 modules (Na, 2016). With the application of the NCS-based curriculum, the new aim of the vocational high school in Korea is to develop a holistic skilled worker.

The need for a well-defined skilled worker

To answer the question "who is a skilled worker?" is not easy. This is because, even for general skilled worker, the term is still unclear and has not been fully defined or debated. The current notion of a skilled worker is linked intrinsically to the level of education, based on the occupational status. However, as the demand for skills changes simultaneously with the changes in the workplace or the labor market, the common notion of "skilled worker" is not sufficient enough to be used in the current globalized world context. Is the definition of a skilled worker sectorial-dependent? For instance, what is defined as "skilled worker" in a particular occupational field of profession such as in automotive industry is different from the "skilled worker" in another field, such as in agriculture? Hence, this calls for a deeper investigation regarding the definition of a "skilled worker." The starting point is to obtain a clear target of the main goals of the vocational high schools.

The expertise development stages of a skilled worker

Expertise in a particular domain could only be obtained through experience and continuous practice in the workplace. And the development of a skilled worker is based on several stages. The stages of development that are presented in this article are based on the expertise development models that may provide useful implications for the preparation and development of a skilled worker at the school level. In addition, the stages can serve as a framework or model that could be used to develop programs or curricula to accelerate the improvements of students in vocational high schools (see Figure 4).

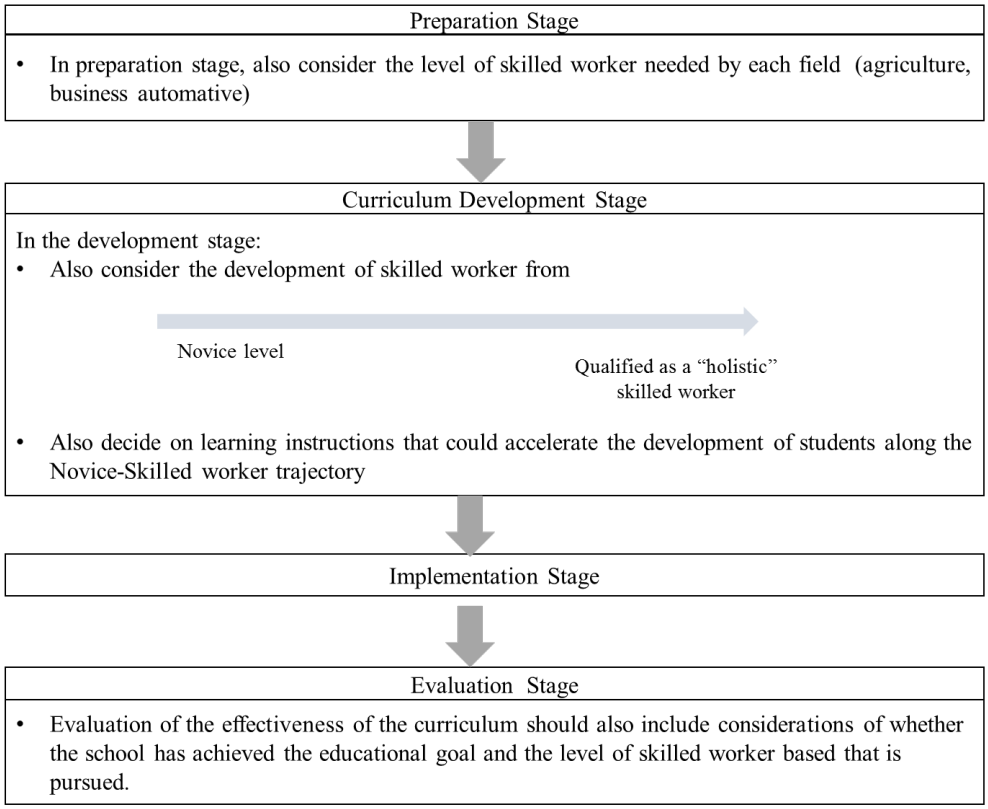

Figure 4: Proposed stages of curriculum development process in vocational high schools

Note: This figure illustrates that in each stage of curriculum development, concepts and the levels of the expertise should also be taken into account.

In the preparation stage for example, the actual competency level of a skilled worker that is required in each field such as agriculture, business, or automotive should be specified. In the curriculum development stage at each school, developers should also consider the development of learning instructions that would be able to accelerate the development of students along the "novice" to "skilled worker" trajectory. In order to do so, even from the early preparation stage, the actual competency level of a skilled worker that is needed by the industrial sector in each field should be analyzed. For instance, one of the programs that seems to incorporate the concept of expertise development and it is currently being implemented in Korea is the Master Craftsman Workshop (*Myeongjang Gongbang*). The program is running in 17 schools as of 2016, and one of the aims of the program is to facilitate the transfer of skills from an early stage (Na, 2016). Hence, to achieve the mastery or expert level would require longer period of practice. Thus, conducting such workshop in vocational high schools could facilitate the transfer of skills from the early stage and thus it could accelerate the attainment of expertise.

CONCLUSION

Despite the numerous efforts and investments in the expansion of the vocational high schools in Korea, it is still ambiguous as to whether the schools have achieved their main goal of supplying the skilled workers that are demanded by the labor market. As far as the vocational high school curriculum is concerned, the education and skills provision in the curriculum are still unclear. Furthermore, most vocational high schools merely follow the guidelines set up by the national curriculum without considering the kind of skilled workers that the vocational high schools have envisioned to produce. Hence, the quality of skilled workers produced by the vocational high schools may not be at the level that is acceptable to the current industries. This article presents critical discussion on the goals and the new direction for the vocational high schools in Korea. In the past, the primary goal of a vocational high school is to prepare individuals for entry level jobs. However, this paradigm is insufficient to produce skilled workers that are able to cope with the changing skills demand in the volatile labor market. Therefore, a shift is necessary whereby the new goal should be focusing on developing a holistic development of a skilled worker ― he or she should be equipped with the knowledge and competencies that are demanded by the industrial sector. Also, the concept of a skilled worker needs to be redefined. Finally, a new framework that considers the levels of skilled worker development could be constructed.

REFERENCES

Blunden, R. (1996). The mind dependency of vocational skills. *Journal of Vocational Education and Training*, 48(2), 167-188.

Dall'Alba, G. & Sandberg, J. (2006). Unveiling professional development: A critical review of stage models. *Review of Educational Research*, 76(3), 383-412.

Dreyfus, S.E. & Dreyfus, H.L. (1980). *A five-stage model of the mental activities involved in directed skill acquisition* (No. ORC-80-2). California: University Berkeley Operations Research Center.

Feltovich, P.J., Prietula, M.J., & Ericsson, K.A. (2006). Studies of expertise from psychological perspectives. In K.A. Ericsson, N. Charness, P.J. Feltovich, & R.R. Hoffman (Eds.), the *Cambridge handbook of expertise and expertise development.* Cambridge: Cambridge University Press.

Han, H.J., Kim, Y.E., Lee, J.Y., Kwak, S.H., Kim, K.H., Kim, K.T., & Hwang, Y.J. (2015). *Development of a comprehensive description of the 2015 revised curriculum (middle and high schools)*. Seoul: Korean Institute for Curriculum and Evaluation (in Korean).

ILO (2008). *Skills for improved productivity, employment growth and development*. International Labour Conference (97th Session) Report.

International Standard Classification of Occupations. (2012). *International Standard Classification of Occupations: ISCO-08. Volume 1, Structure, Group Definitions and Correspondence Tables.* Geneva: ILO. Retrieved from http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publicati on/wcms_172572.pdf

Jang, M.H., Jeon, S.H., & Jung, D.Y. (2014). The improvement needs analysis for pre-service education, induction program and in-service training of secondary vocational education teachers in NCS-based curriculum. *The Journal of Vocational Education Research*, 33(6), 159-182 (in Korean).

Jung, T.H. (2007). Proceedings from the Policy Research Institute Conference: *Fostering the training of skilled technical workers*. Seoul, South Korea (in Korean).

Kalyuga, S. (2007). Expertise reversal effect and its implications for learner-tailored instruction. *Educational Psychology Review,* 19(4), 509-539.

Kinchin, I.M. & Cabot, B. (2010). Reconsidering the dimensions of expertise: From linear stages towards dual processing. *London Review of Education*, 8(2), 153-166.

Korea Research Institute for Vocational Education and Training (2014). *National competency standards learning module manual 2014*. Seoul: National Competency Standards Center (in Korean).

Korea Research Institute for Vocational Education and Training (2014). 2013 *Directory list of specialized vocational high school, comprehensive high school and Meister high school.* Seoul: Korea Research Institute for Vocational Education and Training (in Korean).

Kuchinke, K.P. (1997). Employee expertise: The status of the theory and the literature. *Performance Improvement Quarterly*, 10(4), 72-86.

Lajoie, S.P. (2009). Developing professional expertise with a cognitive apprenticeship model: Examples from avionics and medicine (pp. 61-83). In Ericsson, K.A. (Ed), *Development of professional expertise: Toward measurement of expert performance and design of optimal learning environments*. Cambridge: Cambridge University Press.

Ministry of Government Legislation of Korea. (2009). *Enforcement decree of the Elementary and Secondary Education Act.* Seoul: Ministry of Government Legislation of Korea (in Korean).

Moon, Y.K., Kim, E.J., & You, Y.M. (2013). Study on expertise development process based on Arête. *International Journal of Information and Education Technology*, 3(2), 226–230.

Na, S.I. (2016). *Current innovative programs and policies for vocational and Meister high schools in Korea.* Paper presented at the 12th AASVET International Conference in 2016, Taichung, Taiwan. Retrieved from http://aasvet.yuntech.edu.tw/fullpaper/Speaker%201.pdf

Na, S.I. (2012). Trends and challenges of vocational education and training in Korea. In *the future of vocational education and training in a changing world* (pp. 143-169). VS Verlag für Sozialwissenschaften.

Park, D.Y. (2011). *Korean policies on secondary vocational education: Efforts to overcome skills mismatch and labor shortage*. The Men-Schwerpunkt.

Park, D.Y. (2012). *Expansion and improvement of autonomous operation of Meister high school and specialized high school curriculum*. Issue paper 2016-2 (in Korean).

Park, Y. & Jang, M.H. (2014). *The present and future of secondary vocational education in Korea*. Seoul: Korea Research Institute for Vocational Education and Training.

Ra, S.Y. & Kang, S.H. (2012). 2011 *Modularization of Korea's development experience: Vocational training system for a skilled workforce*. Seoul: Ministry of Strategy and Finance & KDI School of Public Policy and Management.

Ryu, K. & Moon, H. (2015). *Skills for work. Knowledge sharing forum on development experiences: Comparative experiences of Korea and Latin America and the Caribbean*. Inter-American Development Bank.

The School Curriculum of the Republic of Korea. (2007 December 23). Annual Report No. 2007-79. [http://ncic.kice.re.kr/english.kri.org.inventoryList.do#]

The School Curriculum of the Republic of Korea. (2009 December 23). Annual Report No. 2009-41. [http://ncic.kice.re.kr/english.kri.org.inventoryList.do#]

UNESCO Institute for Statistics (2012). *International standard classification of education: ISCED 2011*. Montreal, Canada: UIS.