

THE EFFECTS OF LEARNERS' JOB COMPETENCY DEVELOPMENT ON THE IMPROVEMENT OF THEIR VOCATIONAL KEY COMPETENCIES IN LIFELONG EDUCATION BASED ON NATIONAL COMPETENCY STANDARDS (NCS)

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Abstract

This study is intended to look into the effects of learners' job competency development on their vocational key competency improvement in lifelong education based on national competency standards in Korea. To achieve this, a survey was empirically carried out to 480 learners of lifelong education institutions in Seoul. A statistical analysis was based on this survey. And a covariance analysis was conducted to allow for external influences of lifelong education learners' educational environment in the process that verifies the effects of job competency development on vocational key competencies classified into 4 units such as mathematical skill, problem-solving skill, resource management skill, and communication skill. The findings were summarized as follows. First, all factors of job competency development had no effect on mathematical competency in the single dimension. Secondly, the testing of hypothesis 2 showed that education system ($F=3.021$, $p<.05$) and curriculum ($F=6.684$, $p<.05$) of job competency development factors had a significant positive effect on mathematical competency in the single dimension. Third, the testing of hypothesis 3 showed that only curriculum ($F=5.865$, $p<.05$) of job competency development factors had a significant positive effect on resource management in the single dimension. Fourth, the testing of hypothesis 4 showed that all factors of job competency development had no effect on communication in the single dimension. As for the findings stated above, the proper harmony of both education system and curriculum or all education system, curriculum and evaluation management in the combination of lifelong education support with teaching interaction can have a positive effect on the improvement of communication.

Keywords: Job Competency Development, Learning Environment, Lifelong Education, National Competency Standards (NCS), Vocational Key Competencies.

1. Introduction

As the knowledge and information cycle is becoming shorter due to the accelerated transformation into the knowledge information society, the need for continual, life-long education and learning is on the rise while greater emphasis is placed on the re-education for and participation in the society by the senior citizens as the population of the senior citizens is increasing in the aging society. In line with this change in the social environment, the Korean government established 'the 3rd base plan for life-long education promotion ('13 ~'17) for 'nation's life-long learning system development in the age of 100 year longevity' (Government Project 72), setting up the national level life-long learning system, and is pursuing after the expanded opportunity for the citizens' life-long education. As a part of this plan, the current government is pursuing after the establishment of the 'general online life-long learning service net', establishment of eup, myeon and dong unit 'happy learning center' and cultivation of

life-long learning centered universities(Education, 2014; Education, 2013).

Although there is a difference by the program operated by each institution, life-long education statistical survey administered in 2013 demonstrates that Korea's life-long education students are mostly women, as their participation rate is higher than that of men. As for the age, those between the ages of 30 and 50 comprise the majority. In the case of the investigation on occupation type, share of the housewives is the highest, followed by company workers and senior citizens in the order mentioned. However, due to the vitalization of degree programs such as Academic Credit Bank System, number of students in their 20s is on the rise. Share of men is increasing in case of the occupational skill or weekend program. As for the education level, share of high school graduates is high, but participation of university graduates is increasing fast these days as well. The Ministry of Labor that led development of each occupational competency and national standardization of qualification systems, developed National Competency Standards (NCS), linking together all the educational and qualification programs. Accordingly, unified education is being carried out at the national level, but this is not yet adopted for the life-long education system (Education, 2013).

As such, it is necessary to link with the recent base system for the National Competency Standards (NCS) in order for the life-long education centers established by the universities as their affiliated institutions with the aim of acting on the life-long education to satisfy the life-long education needs of diverse students to work their life-long educational function effectively, intentionally and structurally. Currently, unlike the past when life-long education centers operated programs merely with the voluntary will of the students when it comes to recruiting of the students compared to the non-university life-long education facilities, life-long education centers today now face a reality in which they have to work hard to attract students, competing with diverse outside life-long education facilities. The Korean government that completed the National Competency Standards (NCS) from 2002 to 2014, is integrating with the goal of reforming the society from the 'education level centered society' to 'competency centered society' at the national level to strengthen national competence system, NQF (National Qualification Framework) just in time for the completion of the National Competency Standards (NCS). Likewise, the goal is to offer integrated NQF education and training until 2017 starting with pilot program held in 2014, the year when the university education (Education, 2014; Education, 2009; Education, 2010; Education, 2013). NCS based education model development was completed (Kim & Lee, 2014).

NCS emphasizes an effective connection between life-long education and work field. To realize competency centered society, it is a necessary factor in the ideal worker qualifications demanded by the field of labor into the education program, and to provide the scope for recognizing grade for prerequisite learning to factor into the education system completed at each life-long education institution. This, in turn, aims to develop effective competent human resources cultivation system for the life-long education using the unification system for the students to enter companies, get promoted and earn license while reducing social waste (Gang, et al., 2013). In other words, aim is to recognize the qualification and competency of the students who completed the education program executed in life-long education in addition to the occupational training related to the applicable occupation, to complete actual work, and to satisfy requirements by linking specialized knowledge and skills needed for work execution to the life-long education field (Kim & Kim, 2103; Kim, et al., 2013; Jang & Park, 2014; Heo, et al., 2013).

Towards this end, NCS' competency centered standardized 'curriculum' developed based on the connection of the current industry-academic institutions will be favorable to the life-long education students acquiring occupational competency or skills since occupational training system centered on the actual work execution competency,

specialized knowledge or qualification skill will be linked and factored into the life-long education program as well and since education carried out by life-long education institutions, Human Resources Development Service of Korea or occupational school is divided into two, maintaining one system. However, education carried out by life-long education institutions today is being operated, separate from the curriculum developed based on the national job competency standard, and there is virtually no research on the performance of the life-long education linked with NCS for actual work execution or for increasing specialized skill and knowledge (Education, 2009; Education, 2010; Education, 2013; Kim & Lee, 2014; Park, et al., 2013).

To this, the purpose of this study is to propose industrial and academic implications and make recommendations for improvement based on the base study of the linked operation of universities' life-long education based on NCS when it comes to the life-long education.

2. Theoretical Background

2.1 Concepts and Characteristics of National Competency Standard (NCS)

National Competency Standards (NCS) refers to 'scientific and systematic identification of the competency needed for a worker to carry out his or her work successfully and the national level standardization of these skills'. This is the standardized base for the standardized competency required of individuals, and assessment and evaluation of the acquisition of this competency (Jin, et al., 2012).

First, concept of competency in case of National Competency Standards (NCS) is focused on the successful work execution (Performance-Based) more so than the work process in the industrial field. In other words, focus is on the set of works that a worker has to carry out to produce outstanding performance instead of the work that a worker carried out.

Second, National Competency Standards (NCS) is focused on observable activity (Activity-Based). In other words, essence is not about learning simple knowledge and skill. Instead, this signifies that this knowledge and skill need to be expressed as observable activity that can be evaluated and that can produce outstanding performance in industrial field. Third, National Competency Standards (NCS) is quality centered (Quality-Based). In other words, focus is on how the quality of competency reached a specific level instead of evaluating how many different types of competencies an individual has (Son, 2008).

The key components of the National Competency Standards (NCS) that has these characteristics are Competency Unit, Competency Type, Competency Unit Map, Competency Unit, performance standard, knowledge, skill, attitude, work situation and evaluation guideline (Training, 2014; Hwang, 2014).

Meanwhile, National Competency Standards (NCS) presents Competency Unit Map, which can be considered a form of competency map. This refers to presenting the Competency Units needed for executing work of applicable occupation systematically by dividing into type and hierarchy (Korea, 2013). Competency Unit, Competency Type and Competency Level, which are Competency Unit Map's components, can be considered to be the same as the competency map's components, Competency Unit, Competency Type, and Competency Level.

Nation's National Competency Standards (NCS) is the standardization of the job competency (knowledge, skill and attitude) that an individual needs to carry out his or her work successfully in the industrial field by applying them scientifically and systematically. NCS (National Competency Standards)'s foremost priority is to cultivate the human resources who are most suitable for the industrial field that is changing fast, instantly and systemically.

Through this, its ultimate goal is to substantiate the human resource development system by linking together the basic qualification for work and life-long education training, and to transform the life-long education training, and qualification system from that of the existing education level centered to the competency centered to increase practical value of human resource development (Hwang, 2014).

2.2 Life-long Education Environment and Problems

The current life-long learning method is based on the types that are used most often at this point, and it is operated by classifying into hobby activities, work competency development, and degree and non-degree programs. In case of Academic Credit Bank System and cyber universities, the goal itself is to earn credit. In case of the cyber universities, share of work competency development is greater besides obtaining credits compared to the Academic Credit Bank System. In particular, in case of the cultural centers and life-long learning facilities operated by companies and public institutions, share of hobby activities is higher than work competency development and most are non-degree programs. In case of the employment insurance refund program or remote training institution that companies use frequently, they are characterized by no conferring degree while they are focused more on work competency development rather than offering hobby activities.

In case of the occupational schools and companies' in-house universities as well, there are many instances in which degree that is comparable to that which is conferred by regular universities are conferred.

The Learning system is advancing according to the work environment and skill environment changes based on the life-long education program analyzed through Fig. 1. Through this, service is provided by realizing life-long learning system for the work competency development.

In other words, convergence phenomena of diverse forms are taking place, spearheaded by broadcasting and communication convergence as the case of skill environment change, and education business using NCS is gaining highlight as a growth industry. Moreover, concept of life-long employment is disappearing. Education environment of today when early retirement, youth unemployment and others are becoming a commonplace. Various existing work competency development life-long learning programs need to move towards integrated education system based on the connection with NCS base. Moreover, it is possible to pursue after the work competency development for the company workers through the NCS based life-long learning system that factors in the work environment and skill environment.

3. Research Method

3.1 Research Model

The purpose of this study is to examine the effect of learner 's job skill development on the improvement of job basic ability in National Continuum Disability Standard (NCS) - based lifelong learning.

Hypothesis 1: The factors of job skill development in lifelong education will positively affect the ability of repair.

Hypothesis 2: The factors of job skill development in lifelong education will have a positive effect on problem solving ability.

Hypothesis 3: In the lifelong education, job skill development factors will have a positive effect on resource management ability.

Hypothesis 4: The factors of job skill development in lifelong education will have a positive effect on communication ability.

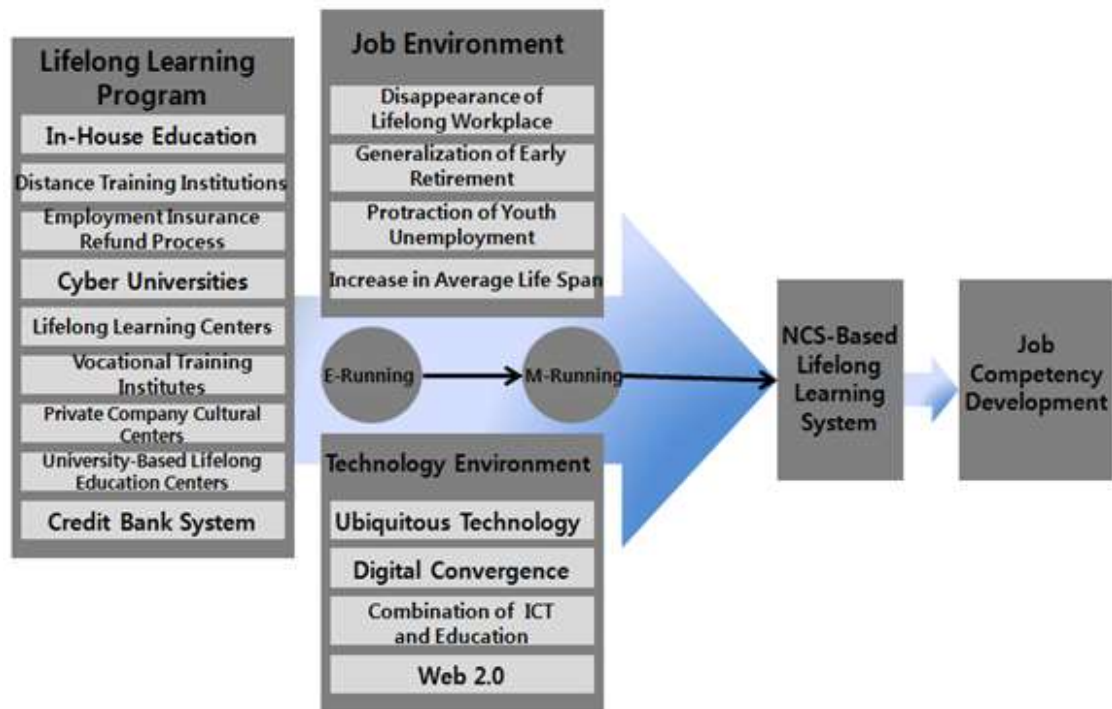


Fig 1: Environment of Lifelong Learning for Development of Job Competency

3.2 Research Subjects

To carry out this study, 480 current students of the National Competency Standards (NCS) were selected randomly at eight life-long education centers in Seoul. They were studied during 28 days from January 29 to February 28, 2016 with questionnaire. Among them, 25 unreliable or unfit questionnaires were excluded, and 455 were used in the end for statistical analysis.

3.3 Research Tools

Research tools used to carry out this study effectively are as follows; previous data such as '13 National Competency Standards (NCS) development manual (Korea, 2013), '14 National Competency Standards (NCS) development manual (Korea Research Institute for Vocational Education and Training, 2014) and training program manual for the '13 National Competency Standards (NCS) based training standard (Korea, 2013) and training program manual for the '14 revised National Competency Standards (NCS) based training (Training, 2014), NCS learning module development manual and learning module case (Jung, 2013). Their contents were factored into the research tools, and texts and questions were modified and complemented to suit the characteristics of this study, and the final research tool consisting of 37 questions was confirmed.

3.4 Analysis Method

This study administered frequency analysis first and foremost to examine research subjects' general characteristics. Then, correlation analysis was carried out before verifying hypotheses. Correlation among the conceptual variables used for the study was examined, and analysis of covariance was conducted to verify hypotheses.

Table 1: Composition of Questionnaire

Factor		Question Numbers	Reliability	Scale
Job Competency Development Factors	Education System	3	.886	Likert 5-point Scale
Job Competency Development Factors	Curriculum	4	.672	Likert 5-point Scale
Job Competency Development Factors	Evaluation Management	4	.685	Likert 5-point Scale
Lifelong Education Environments	Interaction with Teacher	3	.619	Likert 5-point Scale
Lifelong Education Environments	Lifelong Education Support	3	.807	Likert 5-point Scale
Vocational Key Competencies	Communication Skill	4	.718	Likert 5-point Scale
Vocational Key Competencies	Mathematical Skill	4	.783	Likert 5-point Scale
Vocational Key Competencies	Problem-Solving Skill	4	.842	Likert 5-point Scale
Vocational Key Competencies	Resource Management Skill	4	.746	Likert 5-point Scale
Demographic Characteristics		4		Nominal
Total		37		

4. Data Analysis

4.1 General Characteristics

A frequency analysis was conducted to examine the general characteristics of the subjects. The results of the analysis showed that gender were 309 women (67.9%) and 146 men (32.1%). As for the age, 40s were 192(42.2%), 50s (27%), 30s (20%), 20s (7.7%) and 60s (3.1%). The highest education level were 225 high school graduates (49.5%), college graduates 173 (38%), under middle school education 25(5.5%), university 24(5.3%), over master education 8(1.8%). The semesters number of lifelong education participation were 157 (34.5%) three times, 131 (28.8%) four times, 20.9% five times or more, and 72 (15.8%) two times.

4.2 Correlation Analysis

Correlation analysis was conducted to investigate the correlation between research concepts used in this study. Correlation analysis is a statistical analysis method that examines the bi-directional causal relationship between variables.

The analysis showed that there was a significant positive correlation between the sub - variables ($p < .01$). Among them, communication showed relatively low correlation with other variables, and mathematical ability and problem solving showed the highest positive correlation (0.675).

Table 2. Correlation Analysis Result

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
①	1								
②	.454**	1							
③	.399**	.579**	1						
④	.345**	.463**	.478**	1					
⑤	.323**	.506**	.468**	.441**	1				
⑥	.156**	.284**	.297**	.218**	.258**	1			
⑦	.344**	.447**	.407**	.468**	.432**	.292**	1		
⑧	.414**	.439**	.421**	.445**	.462**	.306**	.675**	1	
⑨	.278**	.466**	.423**	.392**	.392**	.665**	.538**	.534**	1

①Education System ②Curriculum ③Evaluation Management **p<.01
 ④Teaching Interaction ⑤Lifelong Education Support ⑥Communication
 ⑦Mathematical Skill ⑧Problem Solution ⑨Resource Management

4.3 Verification of Hypothesis

The purpose of this study is to investigate the effects of educational factors (education system, curriculum, and evaluation management) on basic competence (mathematical skill, problem solution, resource management, communication). Analysis of Covariance (ANCOVA) was used as a statistical analysis method to take into consideration the influence of the teaching interaction. The model explanatory power (R²) was calculated to test the suitability of the hypothesis.

4.3.1 Verification of Hypothesis 1

The results of this study are as follows: Hypothesis 1: The explanatory power of the model (R²) was 40.9% (36%), and the significance of the model F = 8.294 (p <.001), respectively. (F = 2.463, p <.05), education system * evaluation management (F = 2.463, p <.05) F = 2.152, p <.05) and curriculum * evaluation management (F = 2.840, p <.05). In addition, the lifelong education environment factors such as teaching interactions (F = 20,741, p <.05) and lifelong education support (F = 15.392, p <.05) In this way, the factors of development of job ability are not solely affecting the ability of repairing in the process of teaching interactions and of lifelong education support, and education system, curriculum and evaluation management do not affect the ability of repairing and can have a positive effect.

Table 3: Testing of Hypothesis 1

	Sum of Squares	Mean Square	F	p
Correction Model	62.137	1.775	8.294*	.000
Fragment	7.898	7.898	36.90*	.000
Teaching Interaction	4.382	4.382	20.47*	.000
Lifelong Education Support	3.294	3.294	15.39*	.000
Education System(A)	1.321	.330	1.543	.189
Curriculum(B)	.967	.484	2.259	.106
Evaluation Management(C)	.588	.196	.916	.433
(A)*(B)	3.690	.527	2.463*	.017
(A)*C)	3.685	.461	2.152*	.030
(B)*(C)	2.431	.608	2.840*	.024
(A)*(B)*(C)	.261	.065	.305	.875

Model Explanation Power $R^2=.409(.360)$

* $p < .05$, (A): Education System (B): Curriculum, (C): Evaluation Management

4.3.2 Verification of Hypothesis 2

The results of this study are as follows: Hypothesis 2: 45.3% (40.7%) of the model explanatory power (modified R^2) showed that the factors of job skill development in the lifelong education will positively affect the problem solution. $F = 9.916$ ($p < .001$), respectively. As a result of the hypothesis test, the educational system ($F = 3.021$, $p < .05$) and the curriculum ($F = 6.684$, $p < .05$). The interaction variables among job development factors were education system * evaluation management ($F = 2.622$, $p < .05$), curriculum * evaluation management ($F = 4.065$, $p < .05$). In addition, it was found that faculty interaction ($F = 8.320$, $p < .05$) and lifelong education support ($F = 18.912$, $p < .05$) had a positive effects on problem solution.

Table 4. Testing of Hypothesis 2

	Sum of Squares	Mean Square	F	p
Correction Model	59.929	1.712	9.916*	.000
Fragment	12.183	12.183	70.551*	.000
Teaching Interaction	1.437	1.437	8.320*	.004
Lifelong Education Support	3.266	3.266	18.912*	.000
Education System(A)	2.087	.522	3.021*	.018
Curriculum(B)	2.308	1.154	6.684*	.001
Evaluation Management(C)	.832	.277	1.607	.187
(A)*(B)	1.942	.277	1.606	.132
(A)*C)	3.622	.453	2.622*	.008
(B)*(C)	2.808	.702	4.065*	.003
(A)*(B)*(C)	1.049	.262	1.519	.196

Model Explanation Power $R^2=.453(.407)$

* $p < .05$, (A): Education System (B): Curriculum, (C): Evaluation Management

In this way, the factors of development of job skills are positively influenced directly by the educational system and the curriculum in the process of the interactions of the teaching interaction and the lifelong education support. On the other hand, in the case of the evaluation management, it can be said that interaction only positively affects the improvement of problem solution.

4.4.3 Verification of Hypothesis 3

The hypothesis 3: 36% (30.7%) of the model explanatory power (modified R²) showed that the factor of job skill development in the lifelong education will positively affect the resource management. F = 6.745 (p < .001), respectively. As a result of the hypothesis test, only the curriculum (F = 5.865, p < .05) showed a significant positive effect on the resource management in the single dimension, and among the interaction variables among the job development factors. * Only the curriculum (F = 2.413, p < .05) showed a significant positive effect on resource management. In addition, the lifelong education environment factor (F = 13.236, p < .05) and lifelong education support (F = 6.567, p < .05) showed positive effects on resource management.

In this way, the factors of job skill development are positively influencing resource management in the process of teaching interactions and lifelong education support, and the curriculum has a positive effect on resource management. It can be affected.

Table 5: Testing of Hypothesis 3

	Sum of Squares	Mean Square	F	p
Correction Model	97.142	2.775	6.745*	.000
Fragment	5.447	5.447	13.236*	.000
Teaching Interaction	2.702	2.702	6.567	.011
Lifelong Education Support	3.895	3.895	9.465	.002
Education System(A)	1.584	.396	.962	.428
Curriculum(B)	4.827	2.413	5.865	.003
Evaluation Management(C)	.626	.209	.507	.677
(A)*(B)	9.240	1.320	3.208	.003
(A)*C)	2.621	.328	.796	.606
(B)*(C)	2.867	.717	1.742	.140
(A)*(B)*(C)	1.505	.376	.914	.455
Model Explanation Power R ² =.360(.307)				

*p<.05, (A): Education System (B): Curriculum, (C): Evaluation Management

4.3.4 Verification of Hypothesis 4

As a result of the hypothesis 4, the factor of explaining the model (R²) was relatively low (32.4%, 25.9%), and the model explanatory power. The significance was found to be F = 3.454 (p < .001). As a result of the hypothesis test, it was found that the factors of job skill development had no effect on communication in a single dimension. Among the interaction variables among the job development factors, the education system * curriculum (F = 3.595, p < (F = 2.915, p < .05) had a significant positive effect on communication. In addition, lifelong education support (F = 4.867, p < .05) among the factors of lifelong education was found to have a positive effect on communication, but teaching interaction did not.

In this way, the factors of job skill development are the improvement of communication when the education system and the curriculum harmonize or the education system, the curriculum, and the evaluation management are appropriately harmonized in the course of the parallel of teaching interaction and lifelong education support. And it can have a positive effect.

Table 6: Testing of Hypothesis 4

	Sum of Squares	Mean Square	F	p
Correction Model	58.278	1.665	3.454*	.000
Fragment	12.251	12.251	25.410*	.000
Teaching Interaction	.658	.658	1.365	.243
Lifelong Education Support	2.347	2.347	4.867*	.028
Education System(A)	1.514	.378	.785	.535
Curriculum(B)	.396	.198	.410	.664
Evaluation Management(C)	.296	.099	.205	.893
(A)*(B)	12.133	1.733	3.595*	.001
(A)*(C)	6.703	.838	1.738	.088
(B)*(C)	2.760	.690	1.431	.223
(A)*(B)*(C)	5.622	1.405	2.915*	.021
Model Explanation Power R ² =.324(.259)				

*p<.05, (A):Education System (B):Curriculum, (C):Evaluation Management

5. Discussion and Conclusion

Through this, it is possible to know that National Competency Standards (NCS) cannot affect mathematical competency in education system, curriculum, and evaluation management alone during the process in which instructional interaction and life-long education support are carried out together, and that it can produce positive influence on the mathematical competency only when mutual harmony is realized.

Through this, National Competency Standards (NCS) exerts a significant positive effect on the mathematical competency directly when it comes to the education system and curriculum during the process in which instructional interaction and life-long education support are carried out together. Meanwhile, in case of evaluation management, it is possible to see that positive effect is exerted for improved problem solving only through the interaction between education system and curriculum.

Through this, National Competency Standards (NCS) exerts positive effect on the resource management directly when it comes to the curriculum during the process in which instructional interaction and life-long education support are carried out together, and even greater positive effect can be exerted in improving mathematical competency through interaction with education system.

Through this, National Competency Standards (NCS) exerts a positive effect on the improved communication during the process in which instructional interaction and life-long education support are carried out together when education system and curriculum are harmonized or when education system, curriculum and evaluation management formed harmony.

When the above mentioned results are examined, it was proven that the job competency development element in the life-long education did not exert direct effect

on the mathematical competency and communication competency among the four competencies; base work competencies, mathematical competency, problem solving competency, resource management competency and communication competency. Increasingly, a greater positive effect was exerted on the problem solving competency and resource management competency. This shows that the National Competency Standards (NCS) for the life-long education students who are getting life-long education and environment element that supports life-long education Serve as the resourceful support and base for adapting and advancing by grating together specialized knowledge or skill for the actual work execution at the field when it comes to the problem solving competency and resource management competency for improved base work competency in order to enter into the competency centered society from the education level centered society at the national level. In other words, while it was dismissed since only very limited (partial) mathematical computation competency or communication competency were affected, it signifies that the positive effect is exerted on the problem solving competency that entails overcoming difficulty or difficult assignment in specific job, and on the management competency for the given job or assignment when it comes to limited human and physical resources. This signifies that the existing life-long education needs to deviate from the existing education system that focuses on the hobby activities and credit acquisition. Instead, occupational training and life-long education need to focus on the education centered on improved thinking ability that affects problem solving by developing integrated competency centered job competency and that affects resource management competency's job management adaptation and improvement. Accordingly, occupational education should be converted into one that is focused on thinking, comprehension and current issue solving instead of the NCS based work environment in the life-long learning program and simple knowledge delivery education that factors in the job change now that the reality is digital convergence environment of the diverse forms and as the early retirement and youth unemployment are becoming a norm.

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