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A study on the future competency-based pre-service elementary teacher education program

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Abstract

The purpose of this study is to devise and present an educational model to strengthen teachers' future competencies based on the effects of existing core competency education. For this purpose, a literature study was conducted to examine the concepts and directions of future education and core competencies, core values, teaching and learning models and instructional design principles, components and instructional design procedures, and major characteristics of the 2015 revised curriculum. Specifically, a working group composed of experts from various majors was organized, extracted through the Delphi method, and the curriculum was reorganized based on the classified future core competencies to find ways to revitalize the future core competencies of pre-service teachers. Through this, the focus was on presenting specific methods for the expression of future teaching capabilities as instructors and providing an efficient roadmap to keep up with the overall trend of the education world according to the needs of the times.

Keywords: future education, competency, teacher education, pre-service elementary teacher, Delphi study

A study on the future competency-based pre-service elementary teacher education program

1. Introduction

Through the advent of the 4th Industrial Revolution and the unprecedented COVID-19 pandemic that hit the world, our society has undergone great changes. Among them, the field of education cannot be an exception, and these changes and demands of the times have brought about a transformation of traditional school education. Since the 2015 revised curriculum, Korea has been applying a curriculum aimed at fostering creative and convergent talents, and attempts have been made to improve understanding and ability of 'six core competencies' such as self-management capabilities, knowledge information processing capabilities, creative thinking capabilities, aesthetic emotional capabilities, communication capabilities, and community capabilities (Ministry of Education, 2015a; 2015b). What should be noted at this time is that discussions have begun to strengthen core competencies in the future as an extension of the six core competencies. Future core competencies refer to the comprehensive ability required to successfully perform tasks or tasks that learners face or will do and generate results (Korea Institute of Curriculum and Evaluation, 2015).

The main focus of the 2015 revised curriculum and the 2022 revised curriculum which was recently released, is to strengthen the core competencies needed in the future society, and public education efforts to foster creative convergence talent are in line with strengthening capabilities for future school education. Eventually, various changes, including the introduction of new educational methods to prepare and prepare for the future, as well as existing curriculum, methods, and environment, can be judged in the predicted order. It can be said that members of the future society are social talents, which are an integration of knowledge, skills, and attitudes, and require creative and self-directed talents. In other words, after the 4th Industrial Revolution and the New Normal era, it is necessary to educate future core competencies that can develop collaboration, communication, and flexibility of emotional competencies, as well as creativity and problem solving, self-directed learning, and information utilization.

However, there can be no disagreement that the subject of this change in school education is not only the learner who is the subject, but also the teacher in charge of education (Schwab, 2016). In other words, learners have core future competencies compared to future societies, and in the case of teachers who have to educate these learners, securing future educational competencies can be seen as a priority. In other words, it is an urgent task to strengthen the key competencies required in the future society (communication skills, problem-solving skills, creativity, critical thinking skills, collaboration/cooperation skills, etc.) and secure the teacher's future teaching ability to guide them efficiently. Based on this point, it can be said that the discussion of the working group to strengthen and improve teachers' future teaching capabilities and attempts to devise a future teacher education system are very timely.

Fortunately, in recent years, studies have been actively conducted to secure factors necessary for future social learner education and future teaching capabilities. In particular, research and analysis have been reported since COVID-19 to secure teachers' ability to execute classes, including understanding of learners today, and inducing class participation considering the characteristics of these learners, and creating an appropriate class environment. However, the plan to secure teachers' future teaching capabilities, which has the greatest impact on learners' competence and achievement, is far from insufficient compared to these research cases.

In other words, it is urgent to examine the factors affecting future teaching capabilities based on teachers' values, beliefs, and class management skills, develop systematic teacher education programs that can improve teachers' future teaching capabilities, and ultimately present practical measures to prepare effective teacher education policies. Considering this, this study is expected to have implications for developing an educational

model to cultivate teachers with "future education capabilities" required by the 4th Industrial Revolution and post-COVID-19 educational environment, presenting future education capabilities required for elementary school teachers.

2. Background Studies

2.1 Future Education

All the anticipation and preparation of the competencies required for the future society are actively discussed at home and abroad. In Korea, the 2015 revised curriculum was reorganized around competencies, and core competencies were set in the general discussion among future competencies, and curriculum competencies were set in each discussion. The core competency is a cross-curricular and general ability to develop throughout the entire process of school education, and the curriculum competency is a unique competency that can be developed through the curriculum. In this paper, creative and instrumental intelligence, and humanistic intelligence beyond subject achievement standards and subject competencies result in core competencies in the future.

Earlier, the Organization for Economic Cooperation and Development(OECD) led the Definition and Selection of Key Competitions (DeSeCo) project, a study led by the Organization for Economic Cooperation and Development (OECD), was founded in 1997. "DeSeCo" refers to the three core competency categories that individuals must have in the future society (OECD, 2019a). Later, the Future of Education and Skills (hereinafter referred to as the 'OECD Report') have made its importance and necessity widely known. Through discussions among experts from 19 countries participating in the project, the OECD set specific ways to innovate school education and implement it in the field, and suggested the learning goals of school education in 2030 as 'OECD Learning Class 2030' and 'OECD Learning Framework 2030' (Figure 1).

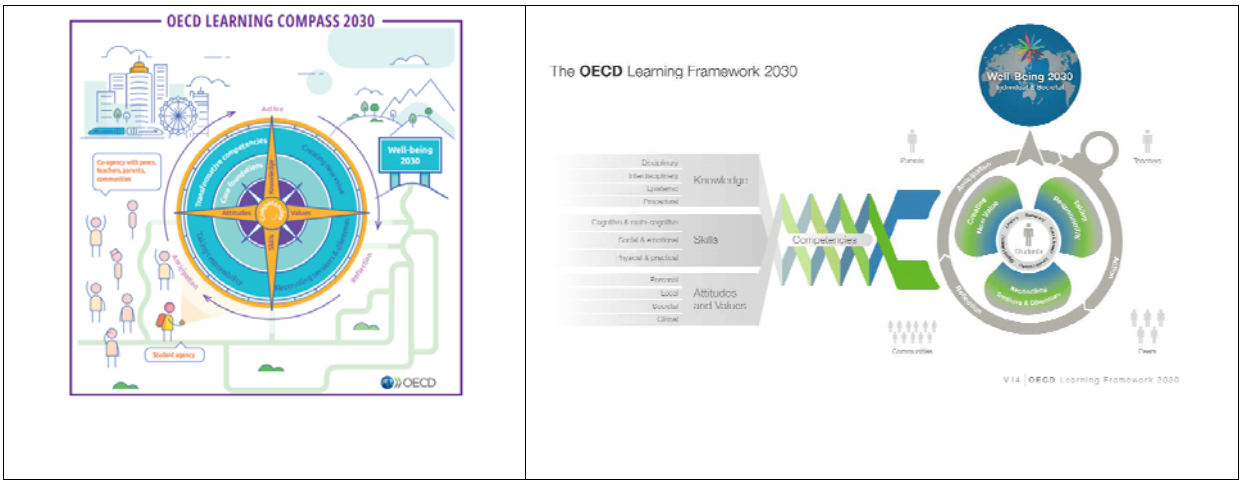

Figure 1. OECD learning objectives and framework (OECD, 2018)

The newly established framework is characterized by the reinforcement of transformative competencies, recognizing that the limited competencies presented in existing DeSeCo projects alone cannot guarantee sustainability for future societies. Specifically, it explains the basic competencies that individuals should cultivate in pursuit of individual and social well-being, transformational competencies that will lead to social transformation, and descriptions that work to foster transformational competencies (OECD, 2019b). It is noteworthy that the subject is referred to as an active learner, and competencies are subdivided into knowledge, skills, attitudes and values, and characteristics are divided into sub-areas in each area. In particular, the newly added converted competency has great implications in that it includes innovative virtues that future learners should have through school education. Table 1 below is the main focus of the transformed competency (OECD,

2019c).

Table 1

Key content of transition capabilities

Category	Key Content
creating new values	innovation as a new growth resource ability to collaborate and collaborate through innovation adaptability, creativity, curiosity, open mind
confrontation/ conflict/confrontation coordination and response	understanding different curriculums and positions toward others recognizing inter-connectivity, avoiding hasty conclusions, and fostering systematic thinking finding balance and compromise in confrontation, conflict, and dilemma
responsibility and moral/ intellectual maturity	the ability to consider the consequences of one's actions risk/compensation, ability to assess self-behavior moral/intellectual maturity, reflection ability, self-regulation and control ability

2.2 Teacher Competency

As society changes, there is a consensus that education should change (Partnership for 21st Century Skills, 2010; USB, 2016). According to a study by Lee et al. (2018), which meta-analyzed future education-related research, future education-related studies emphasize fostering talent with creativity, problem-solving, personality, emotion, communication, and empathy, and teaching and learning should be provided on an individualized, learner-tailored, and high-tech basis. As such, changes in the future society are leading to changes in education, and changes in the competence of teachers who have to perform them are also needed. This has led to a discussion of teachers' competencies, and several studies have been conducted. In Korea, studies were mainly conducted on the competence of elementary and secondary teachers (e.g., Chung et al., 2016; Lim & Hong, 2018; Park et al., 2012), of which relatively few studies were conducted on pre-service teachers (Son et al., 2021). Fortunately, some universities recently conducted competency studies on college students to derive competencies that college students should have, and studies conducted on elementary school pre-service teachers were mainly conducted within the last 1-2 years (e.g. Lee & Kim, 2021; Ohn & Lee, 2020; Sohn et al., 2021).

Table 2

Teacher and pre-teacher competencies presented in previous studies

Study	Target*	Core competencies
Sohn et al., 2021	EPST	Communication competencies, community leadership competencies, multicultural and global competencies, teaching personality and professional development competencies, creative convergence competencies, emotional competencies and empathy, self-management competencies
Kim, 2015	EPST	Learner-based competency, professional development competency, job processing competency, attitude competency on education, relationship competency, temperamental competency
Ahn et al., 2018	EPIT	Job level (class competency, student empathy competency), Relationship level (communication capability, educational community formation capability), Individual level (Teacher identity development competency)
Chung et al., 2016	EPIT	Job competency: life guidance and counseling, connection with parents and local communities, professionalism improvement, teaching skills improvement, educational policy understanding, class management, subject guidance, non-curricular activity guidance, school administration support, Capacity according to future environmental changes: conflict management ability, communication ability, relationship formation ability, patience, understanding of educational environment, understanding student culture, real problem solving ability, collaboration ability, understanding of future society, interpersonal ability, creative innovation, understanding of community, civic consciousness
Moon et al., 2016	SPST	Professional knowledge (sincerity/honesty, flexibility, self-development, ethical consciousness, passion), Building relationships with students (affection and interest in students, respect/trust for students), Communication (expression, communication, listening), Class management and management, Class planning and development (diagnosis/analysis, organization), Class progress (class opening, class progress, lecture strategy, ICT utilization ability), Evaluation and Feedback (Evaluation, Feedback), Multiculturalization, Globalization, Informatization

Park et al., 2012	SPST	Interpersonal competency group (understanding teacher-student relationship, understanding student relationship), Subject expertise competency group (subject knowledge, non-subject knowledge, curriculum development, field research ability), Student comprehension competency group (understanding learning theory, understanding development theory, understanding learner, Teaching and learning competency group (teaching design and development, class operation, evaluation), Communication competency group (verbal communication, nonverbal communication), Counseling competency group (counseling skills, life guidance, career guidance), Administrative & management competency group (class management skills, understanding school management, handling office work)
Kim et al., 2016	SIST	Teaching competency (professional competency, learning support competency, class competency), Student counseling competency (psychological counseling competency, life guidance competency, career guidance competency), Practical teaching competency (class management competency, school affairs management competency, teaching literacy competency), Ability to form an educational community (leadership and communication competency, learning community competency)

*EPST: Elementary Pre-Service Teachers, EIST: Elementary In-Service Teachers, SPST: Secondary Pre-Service Teachers, SIST: Secondary In-Service Teachers

3. Methods: Delphi survey

A Delphi survey was conducted on related experts to define the future education capabilities required for elementary school pre-service teachers and develop appropriate educational competencies to strengthen the future education capabilities of elementary school pre-service teachers. The subjects of the Delphi survey are as shown in Table 3. A Delphi survey was conducted on teacher educators working at domestic and foreign universities of education and universities of education, researcher from educational research institute that is highly linked to teacher education and future education, and a total of nine experts provided advice based on their high understanding of elementary education. In particular, in the case of elementary school teachers, they were selected with a high understanding of future education changes and experience in the case of elementary school teachers.

The Delphi survey was conducted twice, and in the first round, experts' opinions on setting definitions and categories were collected quantitatively and qualitatively, and in the second round, opinions on the developed educational model were collected and analyzed quantitatively and qualitatively.

Table 3

General characteristics of Delphi group

Pseudonym	Gender	Age Group	Title	Affiliation	
A	M	40s	Professor	Singapore	Teacher's college (Science)
B	F	40s	Professor	Korea	Teacher's college(Arts)
C	M	40s	Professor		Teacher's college (PE)
D	M	50s	Professor		Teacher's college(English)
E	M	30s	Professor		Teacher's college (Math)
F	M	30s	Professor		Teacher's college(Pedagogy)
G	M	40s	Researcher		National Research Institution
H	F	40s	EIST*		Elementary school
I	M	30s	EIST*		Elementary school

* EIST: Elementary In-Service Teachers

4. Results

Through the first Delphi survey, a total of 9 experts were presented with 28 competencies extracted first, and opinions on importance (a Likert 5-point scale) and reasons were asked in consideration of whether the presented competencies were future competencies necessary for elementary school pre-teachers. The importance of each competency responded by experts is shown in Table 4.

Table 4

Importance of competency Delphi survey results

No.	Competency	M	SD	No	Competency	M	SD
1	Student comprehension competency	5.00	0.00	15	Convergence capacity	4.67	0.67
2	Education community formation and participation capacity	4.44	0.68	16	Communication skills	4.89	0.31
3	Self-development and management capabilities	4.44	0.50	17	Aesthetic sensitivity capability	4.56	0.50
4	Curriculum restructuring capabilities	4.33	0.67	18	Community competence	4.67	0.47
5	Professional development capabilities	4.67	0.47	19	Technology capabilities	4.56	0.50
6	Job processing capability	3.67	0.67	20	Lifelong learning capabilities	4.22	1.03
7	Competence in attitude toward education	3.67	0.94	21	Creativity	4.78	0.42
8	Future change response capability	4.56	0.68	22	Collaboration capabilities	4.78	0.42
9	Class competency	4.56	0.50	23	Interpersonal skills	4.78	0.42
10	Student guidance competency	4.56	0.50	24	Leadership	4.56	0.50
11	Evaluation capability	4.56	0.50	25	Self-directed learning ability	4.56	0.50
12	Class management capabilities	4.56	0.68	26	Problem solving capability	4.89	0.31
13	Teacher identity development competency	4.00	0.67	27	Global citizenship	4.22	0.79
14	Joint competency	4.11	0.74	28	Responsibility	4.89	0.31

Of the total 28 competencies, a total of 21 competencies received an importance average of 4.4 or higher. This study extracts future educational competencies necessary for elementary school pre-service teachers, but it is necessary to extract core competencies for the operation of the pre-service teacher training curriculum. Therefore, competencies in which even one expert did not select a score (4-5 points) or higher than 'important' were deleted. Therefore, 11 competencies that selected 3 points or less were deleted, and a total of 17 competencies were selected in the second round.

Table 5

List of competencies selected in the second phase of correction

No.	Competency	No	Competency
1	Student comprehension competency	19	Technology capabilities
3	Self-development and management capabilities	20	Lifelong learning capabilities
5	Professional development capabilities	21	Creativity
9	Class competency	22	Collaboration capabilities
10	Student guidance competency	23	Interpersonal skills
11	Evaluation capability	24	Leadership
16	Communication skills	25	Self-directed learning ability
17	Aesthetic sensitivity capability	26	Problem Solving Capability
18	Community competence	28	Responsibility

As a result of the Delphi survey, the following competencies were suggested as competencies that need to be added in addition to those presented in Table 5. Among the suggested opinions, the competency for self-directedness was included in the self-management competency as a competency with a similar meaning to the self-directed learning ability. Competencies for sustainable life are deeply related to community competencies and problem-solving competencies, and multicultural education competencies and integrated

education competencies emphasizing understanding of multicultural and disabled students are considered possible.

E: *"I wish I had the ability to be active or self-directed."*

B: *"Capabilities for sustainable life, such as recognition of environmental problems, should also be added."*

C: *"Multicultural Education Competency, Integrated Education Competency, Self-Management Competency"*

As suggested earlier, previous studies generally suggested general competencies in areas that future talent should have and specific competencies in areas that elementary school teachers should have. Therefore, this study also judged that it was necessary to present the future education competencies of elementary school pre-service teachers by dividing them into competencies that future talent should have and competencies related to their jobs as elementary school teachers. Accordingly, a Delphi survey was conducted to categorize a total of 12 competencies presented in Table 6 into two groups. As a result of collecting opinions on the names of the two competency groups, experts proposed as shown in Table 6.

Table 6

List of competencies selected in the second phase of correction

Category	Competency
Future teaching competency group	Student guidance competency
	Class competency
	Evaluation capability
Future citizen competency group	Self-development and management capabilities
	Aesthetic sensitivity capability
	Technology capabilities
	Creativity
	Problem solving capability
	Responsibility
	Communication skills
	Community competence
	Leadership

5. Conclusions

As stated in the 2015 revised curriculum, efforts to cultivate practical education and competencies for talented ones who will lead the future society are already in progress. Breaking away from the traditional teacher-centered teaching methods in the past, the process of analyzing the relationship between the cause of the problem and another cause, and finding the best alternative is the first step in strengthening learners' future capabilities, and the readiness of pre-service teachers to foster future learners seems more important than ever. In addition, it seems urgent to have the ability to cultivate a wide range of knowledge, skills, attitudes, and values as instructors, as well as to understand learners' intentions, actions, and emotions as the subject of change, and have a positive impact on their lives. As previously stepped on, competency means more than just acquiring knowledge and skills, and refers to the ability to freely utilize knowledge, skills, attitudes, and values to simultaneously satisfy learners' needs.

Considering these points, this study reviewed the effectiveness of existing core competency education and devised and presented an educational model to strengthen teachers' future competencies. To achieve this goal, we conducted a literature research analysis to examine the concept and direction of future education and core competencies, core values, teaching and learning models and instructional design principles, element and instructional design procedures, and major characteristics of the 2015 revised curriculum. In addition, the management and operation of future teacher education programs and teaching-learning future competencies were

collected through domestic and foreign reports and data such as OECD to analyze the characteristics and draw a blueprint for future teacher education programs with future competencies that our elementary school teacher training institution. In addition, an expert Delphi survey was conducted for each major and the validity, importance, and necessity of future education competencies was confirmed.

Based on the results obtained by performing and synthesizing these procedures, basic competencies for strengthening future education capabilities were derived. The basic composition consists of 'future teaching competency' and 'future citizenship competency'. The future civic competency group consists of 1) student guidance competency, 2) class management competency, 3) aesthetic sensibility competency, 4) technology competency, 5) creativity, 6) problem-solving competency, 7) responsibility, 8) communication competency, and 9) leadership.

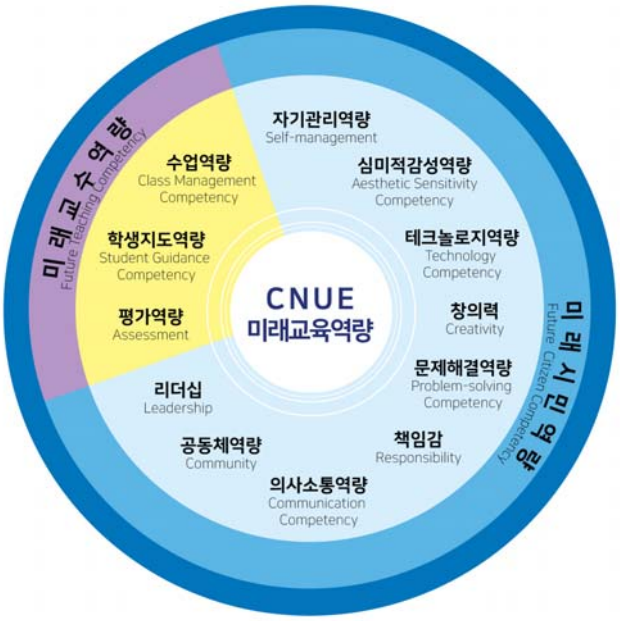

Figure 2. Important competencies for future elementary education program

To sum up, competent student guidance skills are basically required to consider learners' requirements and characteristics based on extensive and wide knowledge and professional knowledge to foster creative and talented people who will lead the future society. In addition, it can be seen that not only the ability to manage classes to understand and practice the purpose of teaching-learning, but also the ability for proper evaluation and reflux in the class process is required. Preliminary teachers will also have extensive and comprehensive skills, including cognitive and meta-cognitive skills such as creative convergence, problem-solving, and self-management, social and emotional skills such as psychological sensitivity, responsibility, community skills, and leadership, and practical skills such as how to use new information and communication technology devices. A comprehensive schematic of these capabilities is shown in Figure 2 above, which can be said to indicate the direction to strengthen better teacher education program for the future education through curriculum reorganization and curriculum improvement in the future.

5.1 Implications

National Institute of Korean Language defines competence as 'the power, skill, ability, etc. to do something'(https://stdict.korean.go.kr/main/main.do). If this is applied to the educational field, educational competency can be replaced with 'the power, skills, and abilities to carry out teaching-learning'. In reality, the core of the various tasks and roles played by classroom teachers can be seen as the function of education and

class managers (class and class management tasks). It is no exaggeration to say that the teacher's competence is absolute to ensure the success of these functions and to fulfill responsibilities efficiently.

In particular, the entry of the Fourth Industrial Revolution, the post-Corona era, and the advent of the New Normal era have made innovation in new education impossible to delay, and the ability of instructors to take charge of learners in this new era is more important than ever. As confirmed by this study, preparation for a sustainable future society, providing learners with experience to produce beyond simply consuming knowledge, and the ability to fluently develop classes to develop future capabilities must be preempted. It can also be said that it needs to be accompanied by the ability to practice education to develop self-management skills, collaboration and communication, problem-solving skills, and creativity competencies.

In this respect, although this study was based on short-term literature research and Delphi experts, it can be said to be meaningful as a sample-like study to cultivate the future education capabilities of pre-service teachers.

Note: In this work, we share the dataset collected during the future education project of CNUE in 2022.

6. References:

Ahn, H., Park, H. J., & Yoon, C. (2018). Development of key competencies for elementary school teachers and an analysis of teacher perceptions. *The Journal of Korean Teacher Education, 35*(3), 243-273.

Chung, J., Yoon, H. J., Kim G., Kang, T., & Ryoo, S.-C. (2016). A needs assessment analysis of beginning teacher's job competences in elementary school. *Teacher Education Research, 55*(2), 201-213. https://doi.org/10.15812/ter.55.2.201606.201

Kim, H. K., & Joo, Y. H., Uhm, J.-Y. (2016). An analysis on job competencies in the life cycle of Korean secondary school teachers. *The Journal of Research in Education, 29*(4), 163-189.

Kim, K. (2015). A study of elementary teachers' core competency analysis through EPP Model. *The Journal of Korean Teacher Education, 32*(2), 1-32. https://doi.org/10.24211/tjkte.2015.32.2.1

Korea Institute for Curriculum and Evaluation. (2015). *The Sourcebook of the Joint Workshop (4th) of the Subject Curriculum Development Policy Research Team on 2015 Revised Curriculum*. Seoul: Korea Institute for Curriculum and Evaluation.

Lee, J., & Kim H.-W. (2021). The development and validation of scale to measure key competency for pre-service elementary school teacher. *The Journal of Korean Teacher Education, 38*(1), 113-142.

Lee, Y. H., Yoon, J., Hong, S., Lim, J. Ill., & Baek, B. (2018). A meta-analysis of the new challenges and approaches for future education. *Journal of Education & Culture, 24*(5), 127-153. https://doi.org/10.24159/joec.2018.24.5.127

Lim, Y., & Hong, H. (2018). Analysis of the perceptions and needs of elementary and secondary teachers on the teachers' key competencies. *Korean Journal of Educational Research, 56*(2), 1-31. https://doi.org/10.30916/KERA.56.2.1

Ministry of Education. (2015a). *Determination and Announcement of the Generals and Particulars of the 2015 Revised Curriculum*. Press Release.

Ministry of Education (2015b). *The General Theory of the Elementary and Secondary School. Notification No. 2015-80 of the Ministry of Education* [Supplement1].

Moon, E., Shim, W. S., & Park, I. W. (2016). An analysis of pre-service teachers' perception on the core competence of teachers. *The Korea Educational Review, 22*(1), 183-209.

OECD (2018). *Preparing our Youth for an Inclusive and Sustainable World: The OECD PISA global competence framework*. https://www.oecd.org/education/Global-competency-for-aninclusive-world.pdf

OECD (2019a). *OECD Future of Education and Skills 2030-Concept note: Anticipation-Action-Reflection cycle for 2030*. Retrieved from http://www.oecd.org/education/2030-project/teaching-and-learning/learning/aar-cycle/AAR_Cycle_conce

pt_note.pdf

OECD (2019b). *OECD Future of Education and Skills 2030-Concept note: Student agency for 2030*. Retrieved from http://www.oecd.org/education/2030-project/teaching-and-learning/learning/student-agency/Student_Agency_for_2030_concept_note.pdf

OECD (2019c). *Teaching Framework 2030*. Retrieved from http://www.oecd.org/education/2030-project/teaching-and-learning/teaching/

Ohn, J., & Lee, N.-Y. (2020). Development of key competencies for pre-service elementary school teachers. *The Journal of Education, 40*(2), 195-214. https://doi.org/10.25020/je.2020.40.2.195

Park, Y.-H., Cho, D.-Y., Bae, H., & Lee, H.-J. (2012). A need analysis on secondary school teachers' job competency. *The Journal of Korean Teacher Education, 29*(2), 299-320. https://doi.org/10.24211/tjkte.2012.29.2.299

Partnership for 21st Century Skills. (2010). *Framework for 21st Century Learning*. Retrieved from http://www.p21.org/about-us/p21-framework

Schwab, K. (2016). *The Forth Industrial Revolution*. Geneva: World Economic Forum.

Sohn, W., Yu, S., Shin, Y., Noh, H., Park, S., Kim, D., Park, M., Kim, N., Lee, B., Shin, E., & Park, C. (2021). Development and validation of the core competency scale for primary pre-service teachers: Applications of Factor and Rasch Analyses. *Teacher Education Research, 60*(4), 683-698. https://doi.org/10.15812/ter.60.4.202112.683

USB (2016). *Extreme Automation and Connectivity: The Global, Regional, and Investment Implications of the Fourth Industrial Revolution.* USB White Paper for the World Economic Forum Annual Meeting 2016. Retrieved from https://www.ubs.com