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Research Article

Analytic study on strengthening the Future Education competencies in Korea

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ABSTRACT

The purpose of this study is to devise and present an educational model to strengthen pre-service elementary school 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 of Korea. After the second expert validation of the developed draft was conducted, it was revised and supplemented to complete the final model of the education model for fostering future education capabilities. Based on the future education competencies obtained through literature research and the Delphi survey, a survey was conducted on professors, in-service elementary school teachers, and pre-service teachers to present the final future core competencies. Specifically, in order to find a framework suitable for the needs and competencies of instructors, previous research cases in and outside of Korea were analyzed, and surveys were conducted with pre-service and in-service teachers, and analyzed. 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 field according to the needs of the times.

Key words: Future education, Competency, Teacher, Capability

INTRODUCTION

Recently, with the development of digital technology and the acceleration of the 4th industrial revolution, a change in the educational paradigm is required. In particular, the uncertainty of the future society suggests that each learner must have the competency and response to change. It is none other than teachers who know the learners who will grow into future talents. Teachers know the student's academic progress and their future can flexibly apply education in response to changes, and have a profound influence on the student's personality and career path. If each teacher functions as a control tower, that is, an educational institution with autonomy and accountability, the curriculum can be innovated. With the innovation of the curriculum, the operation of the curriculum reorganized according to the level and characteristics of the student and education that connects the student's learning with life will be possible. Every student can cultivate competence and develop dreams. Teachers' autonomy and accountability are also keys to respond more appropriately and flexibly to changes. Teachers can be the first to discover areas that the system and policy have not yet been considered and help solve them. This will include psychological and emotional support, including curriculum guidance. In this regard, this paper is intended to find out the teachers' competency for future education and to suggest any pedagogical implications for the pre-service teacher program in Korean contexts.

REVIEW OF LITERATURE

Examples of teacher competency education

The case of the united states

As a representative measure to improve the quality of the pre-service teacher curriculum, the United States has established and operated state-level teacher curriculum standards and qualification standards (Kim, 2021). Recently, there has been active discussion on 'effective teacher professional development' that can have a practical impact on teachers and education sites, and measures to strengthen teacher competency (cultivation) related to future society response using artificial intelligence or big data are centered on STEM. Even if they are not actual STEM majors, both pre-service and incumbent teachers are encouraged to complete training to implement STEM education, and as a result, about half of all public school teachers are participating in the development of expertise related to the STEM field. In particular, computer science education is emphasized as a key educational area to foster future social competence among STEM fields, and teacher training courses and incumbent teacher professional development programs are being strengthened to ensure quantitative teachers who can handle it (Castek *et al.,* 2022).

The case of Finland

In a report titled Learning and Competence 2020, Finland's National Board of Education presented a strategy for

strengthening future teacher competencies. The goal of this strategy is to strengthen teachers' capabilities by enhancing the efficiency of teacher professional development and at the same time strengthening opportunities for teachers' lifelong education. Teacher competency is not officially stipulated, but it focuses on strengthening sincere teacher training to meet social needs, including teamwork, responsibility, dedication to teaching, motivation, determination, communication skills, leadership, reliability and morality (Namgung, 2015).

The case of Singapore

Since 1997, Singapore has implemented educational reforms to foster students' critical thinking, civic consciousness, creativity, and passion for learning under the slogan "Thinking Schools, Learning Nations." Through these educational reforms, the focus was on increasing school autonomy, emphasizing the importance of the learning process, reducing the burden on teachers' classes, and changing classes and evaluation methods.

As illustrated in Figure 1, Singapore's education core is the values that determine students' beliefs or behaviors, and its main core values are respect, responsibility, integrity, consideration, resilience, and harmony (Singapore's Ministry of Education, 2022). In addition, it is based on (1) civic literacy, global consciousness, multicultural technology, (2) critical and creative thinking, and (3) communication, cooperation, and information technology cultivation, which are central factors in fostering future competencies in the 21st century. In the end, the goal of teacher training is also conducted as a preliminary education to develop these learners' capabilities, and specifically, it can be said that it focuses on fostering teachers' capabilities to implement the Applied Learning Program and the Learning for Life Program.

Calls for the education reform in Korea

Structural changes in education are essential in the era of the 4th industrial revolution, the information age, and the rapid change in artificial intelligence. At the same time, re-establishing a new teacher education paradigm for instructors responsible for the future society as well as presenting new educational policy directions and core tasks are tasks that cannot be delayed any longer. Many countries are already innovating education with future capabilities as their main keyword to lead the future society, and Korea also needs to design the direction in which future education should proceed in line with the announcement of the 2022 revised curriculum (Choi, 2020). In the end, providing a roadmap for teacher education with future capabilities is directly related to fostering excellent teachers in preparation for the future society, which can be seen as a prerequisite for learners who will live in the future society.

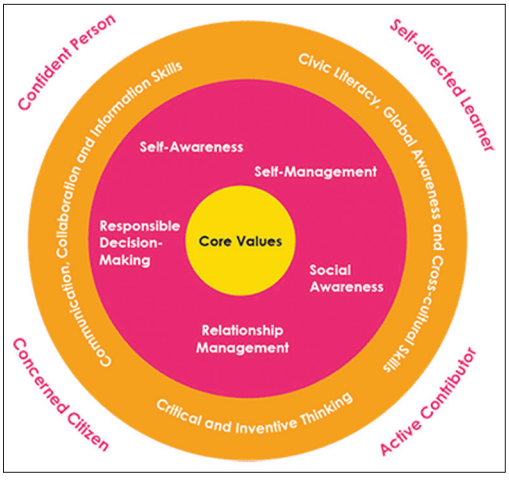

Figure 1: Concept of Singapore's educational goals and competencies

METHODS

Participants

In 2022, a total of 91 people participated in this survey. Specifically, 20 professors working at Chuncheon National University of Education, 33 in-service elementary school teachers, and 38 student-teachers (pre-service elementary school teachers) enrolled at Chuncheon National University of Education participated in the survey. The characteristics of respondents are shown in Table 1.

Data collection and analysis

The questionnaire questions on future education competencies required for elementary school pre-service teachers were developed based on the results of the Delphi survey. After the development of the first question, the final question was determined by confirming the clarity and validity of the expression through discussion among researchers. In early December 2022, the survey was conducted through an online survey through a Google questionnaire for professors at Chuncheon National University of Education, undergraduates at Chuncheon National University of Education (preparatory elementary school teachers), and in-service elementary school

Table 1: Participant characteristics

Content	No.	%
Professors		
Below 5 yrs	3	7.9
5-10yrs	6	15.8
10-20yrs	6	15.8
Over 20yrs	5	13.2
In-service elementary school teachers		
Below 5 yrs	3	7.9
5-10yrs	3	7.9
10-20yrs	12	31.6
Over 20yrs	15	39.5
Pre-service elementary school teachers		
Freshman	9	23.7
Sophomore	21	55.3
Junior	5	13.2
Senior	3	7.9

teachers in Gangwon province. URLs were sent through text messages to respond to the survey, and they individually accessed the URLs and responded to the survey.

Both professors and in-service elementary school teachers were asked about the importance and necessity of future education capabilities, whereas pre-service teachers were asked about their current level and need for each capability. All the questions were composed of a 5-point scale. The results of the responses of professors and in-service elementary school teachers were analyzed using part of the analysis method of Moon *et al.* (2016). In other words, if the importance and necessity were all more than 3.5 points based on 3.5 points, they were adopted as future education competencies for elementary school, and if both necessity and importance were less than 3.5, they were classified as unnecessary competencies. Also, the Borich Need Assessment was analyzed as the result of the response of undergraduate students (Borich, 1980). First, a corresponding sample *t*-test was conducted to see if there was a difference between the current level and the required level, and Borich's demand was calculated as shown in Figure 2 to prioritize the significance level of the corresponding sample *t*-test at 0.05.

RESULTS

Results of the on-campus professors

The responses of professors at Chuncheon National University of Education to the future education competencies of elementary school pre-service teachers derived according to the results of the Delphi survey are shown in Table 2. Based on 3.5 points, the importance and necessity were all adopted as future education competencies for elementary school pre-service teachers, and if both necessity and importance were lower than 3.5, they were classified as unnecessary competencies. As shown in Table 2, both importance and necessity were found to be 3.5 points or higher. Therefore, it can be considered that important and necessary parts as future education competencies of elementary school pre-service teachers have been properly extracted. Among the future education competencies, the most important competency was communication competency, followed by class competency, student guidance competency and responsibility, and community competency. Among the future education competencies, the most necessary competency was student guidance competency, followed by instructional competency, responsibility, and communication skills.

As a result of asking if there are additional opinions on the future education competency required for elementary school pre-service teachers, the following contents need to be added. These contents were reflected in the definition of future education competency as shown in Table 3.

Professor A: "Understanding Children"

Professor B: "I think it is also important to know about changes in the future society and to form an attitude to respond early."

Professor C: "I think it is necessary to cultivate critical thinking skills in relation to media literacy capabilities."

$$\text{Borich's Model} = \frac{\{\Sigma(\text{RCL-PCL})\} \times \text{RCL}}{N}$$

RCL: Required competence level
PCL: Present competence level
RCL: The mean scores for required competence level
N: Total class

Figure 2: The Borich Need Assessment Model

First, self-management capabilities included content about preparations to cope with changes in the future society, and critical thinking capabilities were included in technology capabilities. In addition, understanding of children was included in the definition as considering the level of development of students. Since the response to creativity is relatively low compared to other competencies, and the change in the future society requires creativity and convergence capabilities, the name of the competency was modified from creativity to creative convergence capabilities and the definition was also changed.

Results of in-service elementary school teachers

The responses of in-service elementary school teachers to the future education competencies are shown in Table 4. Based on 3.5 points, the importance and necessity were all adopted as future education competencies for elementary school pre-service teachers, if both necessity and importance were lower than 3.5, they were classified as unnecessary competencies and deleted. As shown in Table 4, both importance and necessity were high at 4.0 points or higher. Therefore, it can be considered that important and necessary parts as future education competencies of elementary school pre-service teachers have been properly extracted.

Among the future education competencies, the competency that in-service elementary school teachers thought the most

Table 2: Evaluation results of the competency of professors in school (n=20)

Competency	Importance		Necessity	
	M	SD	M	SD
Student guidance competency	4.65	0.59	4.75	0.55
Instructional competency	4.8	0.41	4.7	0.47
Evaluation capability	4.5	0.51	4.4	0.50
Self-development and management capabilities	4.4	0.60	4.35	0.49
Aesthetic sensitivity capability	4.2	0.62	3.95	0.60
Technology capability	4.05	0.69	4.0	0.65
Creativity	3.9	0.55	3.9	0.72
Problem solving capability	4.45	0.51	4.55	0.51
Responsibility	4.65	0.59	4.7	0.47
Communication skills	4.85	0.37	4.65	0.59
Community competence	4.55	0.60	4.4	0.75
Leadership	4.1	0.72	4.15	0.81

Table 3: Definition of future educational competency reflecting the opinions of school professors

Competency	Definition
Future teaching competency	
Student guidance competency	Ability to support students' school life and growth based on their needs, characteristics, level of development, and understanding and empathy for the environment and culture surrounding them
Instructional competency	Ability to effectively and efficiently operate teaching and learning based on an understanding of educational goals, teaching and learning, evaluation, and students to fulfill their responsibilities in achieving educational goals
Evaluation capability	Ability to properly conduct evaluations conducted before, during, and after classes in consideration of educational goals, teaching and learning, and students, and to provide feedback accordingly
Future citizen competency	
individual	
Self-development and management capabilities	Ability to plan, practice, reflect, and prepare to cope with changes in the future society in order to have the skills and qualities necessary for one's life
Aesthetic sensitivity capability	Empathetic understanding of humans, open attitude, cultural literacy and sensitivity, and the ability to discover and enjoy the meaning of life and the aesthetic value of objects based on this
Technology capability	Ability to think critically about technology and data, utilize it properly, including adhering to digital information ethics
Creative convergence capability	Ability to produce or fuse new, original, and valuable ideas with an open and challenging attitude
Problem solving capability	Ability to collect, analyze and evaluate information and related materials to solve various problems experienced in learning and life, and to accurately identify and systematically solve problems.
Responsibility	Ability to perform responsibilities or duties as members of the community as important and faithfully
group	
Communication skills	Ability to listen, respect, accurately understand the content, express one's intention, and communicate effectively in an open manner in various situations
Community competence	Ability to actively participate in the development of a group with the values and attitudes required as members of a group with a common goal
Leadership	Ability to direct and coordinate and guide active participation and cooperation of members to achieve common goals

Table 4: Evaluation results of the competency of in-service elementary school teachers (n=33)

Competency	Importance		Necessity	
	M	SD	M	SD
Student guidance competency	5.00	0.00	4.94	0.24
Instructional competency	4.70	0.64	4.61	0.75
Evaluation capability	4.58	0.66	4.52	0.76
Self-development and management capabilities	4.76	0.56	4.73	0.52
Aesthetic sensitivity capability	4.64	0.74	4.70	0.73
Technology capability	4.21	0.86	4.33	0.78
Creative convergence capability	4.36	0.82	4.39	0.83
Problem solving capability	4.67	0.54	4.73	0.57
Responsibility	4.82	0.53	4.76	0.50
Communication skills	4.97	0.17	4.91	0.29
Community competence	4.94	0.24	4.85	0.36
Leadership	4.36	0.93	4.36	0.93

Table 5: Evaluation results of pre-service teachers' competencies (n=38)

Competency	Current level		Necessity level	
	M	SD	M	SD
Student guidance competency	3.16	0.89	4.82	0.39
Instructional competency	3.26	1.03	4.63	0.59
Evaluation capability	3.21	0.96	4.42	0.72
Self-development and management capabilities	3.42	1.11	4.32	0.87
Aesthetic sensitivity capability	3.79	0.99	4.42	0.83
Technology capability	3.61	0.95	4.21	0.87
Creative convergence capability	3.50	1.11	4.08	0.88
Problem solving capability	3.76	1.00	4.55	0.72
Responsibility	4.21	0.96	4.79	0.41
Communication skills	4.00	0.77	4.84	0.37
Community competence	3.97	0.85	4.53	0.60
Leadership	3.68	1.02	4.61	0.64

important was student guidance competency, followed by communication competency, community competency, and responsibility. Although there was a difference in order from the Chuncheon National University of Education professor's high scores in order of communication competency, class competency, student guidance competency, responsibility, and community competency, there were similarities in that they valued communication competency. The future education competency with the highest need for elementary school teachers was student guidance competency, followed by communication competency, community competency, and responsibility.

Table 6: Results of calculating the degree of demand for the competency of pre-service teachers (n=38)

Competency	Difference between Required competence level & Present level		*t*	Borich Need Assessment	rank
	M	SD			
Student guidance competency	1.66	0.97	10.576***	7.98	1
Instructional competency	1.37	1.02	8.233***	6.34	2
Evaluation capability	1.21	1.28	5.845***	5.35	3
Self-development and management capabilities	0.89	1.20	4.583***	3.86	6
Aesthetic sensitivity capability	0.63	1.26	3.087**	2.79	8
Technology capability	0.61	1.28	2.904**	2.55	10
Creative convergence capability	0.58	1.43	2.502*	2.36	12
Problem solving capability	0.79	1.26	3.876***	3.59	7
Responsibility	0.58	0.98	3.656**	2.77	9
Communication skills	0.84	0.86	6.071***	4.08	5
Community competence	0.55	0.76	4.480***	2.50	11
Leadership	0.92	1.22	4.667***	4.24	4

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

Results of pre-service elementary school teachers

The responses of Chuncheon National University of Education's undergraduates to the future education competencies of elementary pre-service teachers are shown in Table 5. When asked about their current level of competency, the overall average was 3.63 points, and when asked how much each competency was needed as a future education competency required for elementary school pre-service teachers, the overall average was 4.52 points. Therefore, undergraduates thought their current competency level was lower than the necessary level. As shown in Table 5, the difference between this required level and the current level was statistically significant.

Table 6 shows the results of calculating the educational needs of pre-service teachers through the Borich Need Assessment. As for the educational needs of pre-service teachers, student guidance competency was the highest, followed by instructional competency and evaluation competency. Student guidance competency, instructional competency, and evaluation competency are all competencies belonging to the future teaching competency group. Through this, it can be seen that pre-service teachers are demanding relatively high education for the future teaching competency group. In the future citizen competency group, the value was high in the order of leadership, communication competency, and self-management competency. Therefore, it is necessary to establish an education curriculum by reflecting the opinions of these pre-service teachers.

CONCLUSIONS

The main focus of this current study was to investigate the major factors in the future education competencies for the pre-service elementary school teacher program. In order to answer this question, a survey was administered to the faculty members at the National University of Education, in-service classroom teachers and pre-service student-teachers. Based on the data analysis, the results are as follows. First, among the future education competencies, the professors considered the most important competency as communication competency, followed by instructional competency, student guidance competency and responsibility, and community competency. Among the future education competencies, the most necessary competency was student guidance competency, followed by instructional competency, responsibility, and communication competency. Second, in-service teachers answered that among the future education competencies, the most important was student guidance competency, followed by communication competency, community competency, and responsibility. Third, pre-service teachers at the National University of Education pointed out that as for the educational needs of pre-service teachers, student guidance competency was the highest, followed by instructional competency and evaluation competency. It is suggested that in order to foster creative and talented people who will lead the future society, competent student guidance capabilities are basically required considering learners' requirements and characteristics based on extensive and wide knowledge and professional knowledge. 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. Pre-service teachers also have to gain extensive and comprehensive skills, including cognitive and meta-cognitive skills such as creative convergence, problem-solving, and self-management, social and emotional skills like psychological sensitivity, responsibility, community skills, and leadership, and practical skills on how to use new information and communication technology devices. In this sense, it can be concluded that the pre-service teacher education program is to be carefully designed and implemented.

AUTHORS' NOTE

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

REFERENCES

Borich, G. D. (1980). A needs assessment model for conducting follow-up studies. Journal of Teacher Education, 31(3), 39-42. https://doi.org/10.1177/002248718003100310

Castek, J., Harris, K., Jacobs, G., & Vanek, J. (2022). *21st Century Learning Ecosystem Opportunities: Research and Findings. Language.* Literacy Language & Technology Research Group and World Education. Retrieved from https://edtech.worlded.org/21cleo-report

Choi, S.-J. (2020). *A study on the OECD Education 2030 project: Implementation strategies of future-oriented competency-based education*. Korea Educational Development Institute, PR 2019-06.

Kim, J. (2021). *Current Status and Implications of Artificial Intelligence (AI) Convergence Education in the United States*. Overseas Education Trends of the Korea Educational Development Institute. Retrieved from https://edpolicy.kedi.re.kr/frt/boardView.do?nTbBoardSeq=&strCurMenuId=10091&nTbCategorySeq=&pageIndex=1&pageCondition=10&nTbBoardArticleSeq=830279&searchTopic =&searchObject=&searchCondition_D=36&searchKeyword_SD=&searchKeyword_ED=&searchCondition_W=6&searchKeyword_W=

Moon, E., Shin, W. S., & Park, I. (2016). An analysis of Pre-service Teachers' Perception on the Core Competence of Teachers. *The Korea Educational Review, 22*(1), 183-209.

Namgung, O. (2015). Competency-based Teacher Education in Finland. Retrieved from https://edpolicy.kedi.re.kr/frt/boardView.do?strCurMenuId=54&pageIndex=1&pageCondition=10&n TbBoardArticleSeq=150115

Singapore's Ministry of Education. (2022). Retrieved from https://www.moe.gov.sg/education-in-sg/21st-century-competencies