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Analysis of research on Korea's 2015 revised special – Education curriculum

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The purpose of this study was to analyze contents of Korea's 2015 revised special education curriculum, focusing on papers published in Korean journals and candidate journals from 2016 (i.e., after December 2015 when the 2015 revised special education curriculum was established) to 2022 (present). Future research directions regarding the curriculum are also presented. To this end, this study analyzed 29 academic papers related to the 2015 revised special education curriculum, in line with the purpose of this study. These studies on the 2015 revised special education curriculum were analyzed as follows. First, trends of study purpose had seven subcategories: analysis of curriculum fitness (one paper), curriculum implementation (six papers), exploration of meanings (four papers), analysis of interest (two papers), identification of contents and characteristics (8 papers), development of curriculum elements (one paper), and reconstitution of curriculum (one paper). Second, based on themes, studies were categorized into studies on general guidelines (seven papers) and studies on subject curriculum (20 papers). Based on study results, future curriculum revision and research directions are discussed.

KEYWORDS

2015 special education curriculum, common curriculum, basic curriculum, subject curriculum, organization and implementation of curriculum

Introduction

The concept of a curriculum can be explained in a variety of ways, including combined perspectives of teachers and students, educational contents, political decisions, and social beliefs, which are key elements of education in determining ways to answer questions of why, what, and how. However, the so-called “passive curriculum” has traditionally primarily focused on contents of education. The core problem of a curriculum is closely associated with the selection and organization of educational contents (Jeon et al., 2018; Won, 2018).

Curriculum development studies should consider education policies. Specifically, according to analysis results for Programs for International Student Assessment, the Republic of Korea's rankings and scores for reading, mathematics, and science were:

reading, scores of 4–9; mathematics, scores of 6–9; and science, scores of 9–14 (Ra et al., 2019).

Moreover, the priority of education policy in Korea is curriculum development (Lim, 2014). This is because curriculum development supports the implementation of classes that are appropriate for the current level of Korean students (Jeon et al., 2018).

To date, Korea's school system plans to pursue a state-level curriculum based on relevant laws and develop classes in accordance with specific action plans established by local educational offices and school units. Korea's national curriculum is a type of legal document because it requires an announcement by the government (the Minister of Education). The law stipulating that the curriculum should be applied to or operated by schools in Korea is based on provisions of Article 31, Paragraph 6 of the Constitution that adopt "Education system legalism."

Special education curriculum in Korea has been revised nine times from 1974 (when the special school curriculum was first announced) to 2015. The 2015 revised special education curriculum is currently being applied to the special education field in Korea. Special education courses are prescribed in accordance with Article 3, Paragraph 2 of the Enforcement Decree of the Act on Special Education for Persons with Disabilities. It is a national-level curriculum to achieve educational purposes and goals for kindergartens as well as elementary, middle, and special schools being attended by special needs students. Here, we present common and general standards for how the curriculum should be organized and implemented for special needs students in these schools.

Korea's educational policies and directions are all chosen and implemented based on the state-level curriculum. Curriculum revisions reflect changes in educational philosophy and trends of the time. The special education curriculum has been revised to reflect this education trend. Special education courses have been revised whenever the general curriculum has been revised. In particular, since the 7th special school curriculum revision in 1998 when elementary and secondary school curricula were revised, the revision was done in conjunction with a different time. The special education curriculum has been revised to achieve harmony between universality and specialty, taking connectivity with the general curriculum, disability types, and disability characteristics into account. From the 2008 revision of the special-school curriculum, educational goals for kindergartens and school levels have been prepared in the same way as those for general schools to strengthen the connectivity with general education. In the 2010 special education curriculum revision, the association with general education was further refined to strengthen not only school level systems such as introduction of grade classes but also curriculum-specific contents corresponding to each subject. The special education curriculum 2015 was revised in 2015 in conjunction with the 2015 elementary and secondary school

curriculum revisions to deal with problems and needs presented in the pursuit of universality of the special education curriculum and subsequent on-site application (Oh, 2014; Gwan J. O., 2019).

One of the focuses of the 2015 revised special education curriculum was the introduction of core competence, which has various meanings among different perspectives. If it is viewed as enabling special school students to enjoy successful future life and build a prosperous society (Park et al., 2014), this core competence is a very important element for students who require special education. The 2015 revised special education curriculum emphasized education reflecting individual characteristics of special education students and clearly indicated that competence of individual students should be strengthened.

To this end, the 2015 revised special education curriculum placed more emphasis on school autonomy than the past curricula. This indicates that curriculum implementation tailored to actual educational scenes is becoming increasingly important. Even a curriculum with good purposes and content would not carry any meaning if it were not properly implemented in schools. In particular, Korea has a national-level curriculum that allows for partial autonomy in its content. The perception and perspectives of schools on curriculum implementation can significantly affect implementation of the curriculum in schools. Snyder et al. (1992) have classified types of curriculum implementation into perspectives on fidelity, mutual adaptation, and curriculum enactment. The fidelity perspective is to determine whether the curriculum is implemented as faithfully planned. The mutual adaptation perspective is to believe that the planned curriculum could be modified in actual scenes. The curriculum enactment perspective is to view the curriculum as an educational experience that teachers and students build together through interactions in classrooms (Kim and Kim, 2017). Autonomy of schools, which is emphasized in the 2015 revised special education curriculum, can be interpreted as implementation of the curriculum from a mutual adaptation perspective as state-level curriculum is tailored by teachers at each school.

Thus, the National Institute of Special Education has conducted research to examine how the 2015 revised special education curriculum is accommodated and implemented in special education sites and found that, overall, the revised curriculum implementation is more positive than the previous curriculum, although it calls for various improvements.

Specifically, according to the 2022 special education statistics released by the Ministry of Education, special education in Korea consists of 27,979 students in special schools, 57,948 students in special classes of general schools, 17,514 students in general classes, and 514 students in special education support centers for a total of 103,695 enrolled students. Moreover, the number of teachers by school structure was found to be 9,866 for special schools, 13,632 for special classes in general schools, and 2,077 for itinerant

education. A total of 14,318 additional people, including special education practitioners, social service workers, and volunteers, are provided to support students with special needs.

The research on special education curriculum aims to identify deficiencies in the curriculum and find tasks for follow-up research, which represents an essential process in the revision of the curriculum. In this study, we reviewed research that has been published since the announcement of the 2015 revised special education curriculum to present implications and future research directions for curriculum revision. To this end, we analyzed studies on 2015 revised special education curriculum published in domestic journals and dissertations from 2016 (the year following the notification of the 2015 revised special education curriculum) to the present time by dividing them into national curriculum standards and subject curriculum. We then discussed their implementation. Based on this examination of the well-established national curriculum, effective education policies can be developed.

Theoretical background

Korea's special education curriculum was designed to provide seamless integration and individualized education for students with disabilities. Therefore, in this chapter, we will introduce the status of Korea's unique special education curriculum, which could differ from that in the West.

Korea's history of integrated education began in 1994 when the Special Education Improvement Act designated a special class for formal integrated education and explicitly pointed to relevant provisions in the law. The [Ministry of Education, 2022](#) Fifth Special Education Development Five-Year Plan (2018–2022) has suggested a base support center with a treatment support team for each type of disability for an integrated education narrative.

According to the 2020 Special Education Statistics, there were 95,420 participants in special education in Korea as of April 2021. Of them, 26,299, 68,805, and 316 students were enrolled in special schools, general schools, and special education support centers, respectively. Compared to those in special schools, students who were integrated and educated in general schools accounted for a higher proportion at 72.1% ([Lee and Jeon, 2018](#)).

Accordingly, the role of special teachers in each school (class) is important for integrated education in Korea. According to their eligibility criteria, special teachers carry out integrated education-related tasks at different schools (grades)—such as kindergartens, elementary schools, middle schools, and high schools—in Korea's integrated education environment. Early childhood special education teachers support the integration of infants with or without disability by integrating or reorganizing the Nuri curriculum (Korea's kindergarten curriculum) and special education curriculum in special classes of Public Elementary School-Annexed

Kindergartens or Inclusive Childcare Centers. Elementary special education teachers are assigned to a special class in a general elementary school to implement an integrated education operation plan that can be completed as needed to comply with the school's curriculum. They can modify or reorganize the curriculum by combining elementary-school general and special curricula according to the current level of students. Secondary special education teachers are placed in middle- and high-school special classes to support integrated education. In Korea, career and vocational education is particularly important for middle- and high-school students. Various types of vocational and transition education are offered. Therefore, integrated education in middle and high schools is a key for career and vocational education ([Shin et al., 2018](#)).

Korea's special needs students receive an education that considers chronological age in terms of kindergarten, elementary-school, middle-school, and high-school grades. The kindergarten course is an integrated education that has been reorganized into five areas of the Nuri course for 3- to 5-year-olds, with a focus on the topic of life and adapting to situation of a school. This course aims to support healthy and harmonious development of the mind and body of special-needs children and promote self-reliance and happiness in everyday life. Elementary-school-aged students are educated for 6 years from grades 1 to 6. Primary education focuses on fostering basic habits and skills necessary for students' daily life and learning with a goal to achieve an upright personality. In elementary school courses, programs based on education of proper disability understanding are primarily developed and applied to develop proper disability perception that supports psychological and social integration. Korea has designated April 20th as Disability Day. It implements different programs intended to foster understanding of various types of disabilities. In addition, elements related to disability understanding are inserted into the curriculum. Using a period for integrated class adaptation, schools can support a smooth, integrated adaptation of special needs students at the beginning of the semester. This typically takes 1–2 weeks depending on the situation of the school and results of individualized education support team consultation in all schools (grades), including elementary, middle, and high schools. At this time, special needs students are incorporated into the general class and work with students without disabilities throughout the day to form friendships and learn by subjects.

An overview of earlier international studies on this topic is shown below.

[Bettini et al. \(2016\)](#) have argued that the quality of teachers can affect curriculum implementation and teaching in the course of curriculum implementation. Regarding research about which areas teachers' understanding of curriculum should be focused on, [Demirbilek and Talan \(2022\)](#) have stated that integrating STEM into the special education curriculum is an important element in integrated education. This is in line with a

study of Bahrum et al. (2017), which has stressed the importance of reorganizing the special education curriculum and stated that it is important to conduct research on how students with disabilities and their families make use of local resources and services offered by schools, local communities, government agencies, and organizations. Lockard (2016) has argued that the special education curriculum should focus on developing functions of students with disabilities.

Korea's special education curriculum has been revised nine times since 1974 in accordance with the revision of the general education curriculum in the sense that it aims for inclusive education. The 2015 revised curriculum is currently being applied to the field of special education in Korea. General research is underway to develop the 2022 revised special education curriculum.

Along with curriculum changes, training of teachers as implementers of the curriculum has been dealt with in the literature as follows. Under supervision of the Ministry of Education, teacher supply and demand policy research studies have been conducted based on discussions about teacher training and supply following the curriculum revision in Korea (Kim et al., 2016).

Methods

Criteria and procedures for selecting reference

Reference selection criteria

In this study, we aimed to find issues in the curriculum and provide directions for follow-up research for the development of future curricula by analyzing research studies that have been conducted since application of the 2015 revised special education curriculum. Findings of this study are expected to help shape a future special education curriculum into a curriculum that considers both special education specificity and the inclusive education aspect.

Therefore, we limited subjects and scope of this study to studies on national and school-level curricula conducted after the announcement of the 2015 curriculum revision. Reference selection and exclusion criteria for this study are as follows:

First, only journal articles were selected for the analysis.

Second, studies were limited to those on the 2015 revised special education curriculum. Therefore, studies on textbooks were excluded.

Third, only studies on teachers' curriculum experiences directly related to the theory of the 2015 revised special education curriculum were selected for analysis. Findings of this study will contribute to the examination of the scope and field of Korea's research on curriculum for students with disabilities in the future for establishing special education curriculum policies through an analysis of Korea's unique

special education curriculum research. Percentages of included or excluded thesis or project research and publications where opinions were received were as follows. Percentages of included studies were: thesis or project research, 30%; and publications where opinions were received, 60%. Percentages of excluded studies were: thesis or project research, 5%; and publications where opinions were received, 5%.

Reference selection process

After searching and listing the first round and the second round of research papers, we reviewed original texts of references. Only those that met the selection criteria were compiled.

Teachers have received various parental opinions during the transition to the Ministry of Education's revised special education curriculum in Korea. General education professors, special education professors, general education teachers, special education teachers, and parents are stakeholders of trainings (Ministry of Education, 2015).

Using the "2015 Revised Special Education Curriculum" and "2015 Special Education Basic Curriculum" as search terms, results of the first round of paper searching of the Research Information Sharing Service (RISS), Korea Information Sharing Service (KISS), and the Google Scholar were listed. Papers on this list were selected first based on titles and abstracts. The second round of paper searching was then conducted. We entered a variety of specific search terms, including each subject name, creative experience activities, selection-oriented curriculum, and curriculum reorganization to make sure there were no papers to add. Finally, we compiled the list again by checking whether dissertations and journals overlapped. Next, we reviewed how papers were classified by researchers using the analysis framework. Finally, we selected 44 references to be analyzed.

Analysis process

Analysis criteria

Our purpose of this study was to analyze main contents to find their implications regarding directions of subsequent studies. Since we had relatively few analyzed papers, we did not analyze the number or research methods of papers in terms of publication year commonly done in general trend studies.

We set up an analysis framework for this study by referring to "Research on special education curriculum research trends" (Lee and Jeong, 2010) and "Research that analyzed curriculum studies and presented analysis nomadism in the area of curriculum research." There were two criteria for analysis in this study: curriculum type and study area. Types of curricula were divided into national curriculum standards and subject curriculum. Subject curriculum was divided into basic and selective curricula.

In a prior study on special education curriculum research trends (Oh et al., 2015), curricula types were divided into national curriculum standards as well as differential, basic, common, selective (vocational) curriculum, and creative experience activities. However, for the latter, contents presented in the national curriculum standards were applied to the school. Therefore, they were not reflected in this study because they were not considered to be a type of curriculum.

The study area was divided into national curriculum standards and subject curriculum. For national curriculum standards, we analyzed subjects, purposes, and aims of papers and divided them into two categories: research on curriculum composition and research on school curriculum operations such as core competencies of a curriculum and organization of school subjects. Research area of the theory was then derived using analysis criteria framework of the preceding study (Lee et al., 2021).

For subject curriculum, there have been a few studies on each subject. Moreover, contents of the curriculum are different. Therefore, there are limitations in developing analysis nomadism by categorizing research topics and content or applying analysis nomadism to prior research. The research area was set up as a common, basic, or selective curriculum in detail.

Details of analysis nomadism have been categorized and derived from many papers. However, these details were not set because there were too few analyzed studies. Further, the aim in this study was to analyze the content. The framework of the reference analysis is detailed in Table 1.

Data processing and reliability

We classified papers according to research analysis criteria by creating a summary table of main contents and symbolizing curriculum type and research topic of each paper. For curriculum type, it was recorded as A for the national curriculum standard, B for common curriculum of each subject, C for basic curriculum, and D for selective curriculum. Number was used as a symbol for study topic of analysis criteria. The direction of curriculum development and composition was numbered 1, while the reality and awareness of curriculum application were numbered 2. Subject names were used as it is. For example, a paper on the direction of curriculum development and composition of the national curriculum standards was labeled as A-1. In this process, the match between researchers was calculated using Eq. 1:

$$\frac{\text{matched number}}{\text{matched number} + \text{number of inconsistencies}} \times 100 \quad (1)$$

Results showed a 97% match. For inconsistent papers, we repeatedly consulted with each other to match them. If there was a disagreement, we consulted with an external researcher having experience in curriculum-related research for the final classification.

Results

Analysis of contents of national curriculum standards in the study by area

There has been additional research on curriculum reorganization in terms of practicalities and perceptions of curriculum application. Table 2 lists specific research topics and contents.

Research on curriculum development and composition

The analysis of curriculum development and composition of the national curriculum standards showed that overall curriculum development should consider characteristics of special education students, along with universality of the general curriculum. Studies on curriculum development and composition have covered problems of curriculum development, the need for a review of propriety of core competence and goals of the basic curriculum and subject composition system, directions for evaluation criteria achievement standards, core problems, and the need to improve subject content standards for curricula applied to hearing impaired students. Specifically, for the special education curriculum, the time to prepare for revision was short without sufficient collection of opinions of school teachers, research, or discussions for the revision to fully consider unique characteristics of special education (Lee et al., 2017).

Failure to fully consider unique characteristics of special education casts doubt on the propriety of core competence of the basic curriculum, education goals, and subject composition system. Core competence is a very important consideration because it is the base for each subject content and achievement standard. As for the basic curriculum, a necessity arose for research and conceptualization of core competence reflecting alternative educational curricula (Oh and Kang, 2019). Oh and Kang (2019) have reinterpreted and critically analyzed “competence” presented in the national curriculum standards to reorganize special education curriculum. They have argued that, because a desirable personality is connected with individual core competence, there is a lack of contextual connectivity. They also state that confusion arises because there is no clear separation between concepts of competence and ability. They emphasize that core competence being justified in terms of universality of education does not mean that it also fits unique characteristics of special education. They raised the necessity of re-establishing the concept of core competence in special education and introduced core competence reflecting significance of alternative curricula in the basic curriculum.

Some scholars have also suggested that it is necessary to develop cases to actualize the universality and specificity of the

TABLE 1 Research analysis framework.

Analysis criteria	Analysis nomadism				
	Curriculum types	National curriculum standards		Common curriculum	Subject curriculum
Study area	Curriculum development and organization direction			Curriculum by each subject	
		Curriculum application awareness and reality			Selective curriculum

TABLE 2 Area-specific research on national curriculum standards.

Curriculum type	Study area	Research content	Number of studies	References	
National curriculum standards	Curriculum development and organization direction	Curriculum development process and improvements	1	Lee et al., 2017	
		Ways to apply competencies in special education curriculum	1	Oh and Kang, 2019	
		Educational goals and composition of basic curriculum	1	Baek, 2019	
		Explore the direction of development of assessment-based achievement criteria	1	Kang et al., 2020	
	Curriculum awareness and reality	Problems developing common curriculum (hearing impairment)		2	Gwan, 2016, 2017
			Teachers' interest and practice of the curriculum	3	Shin et al., 2018; Song and Choi, 2019a,b
		Curriculum reorganization awareness and reality	5	Park J. S., 2017; Yang, 2018; Kim and Jeong, 2019; Kim and Yoo, 2020; Lee et al., 2020	
		Other things	3	Lee, 2017; Moon, 2017; Kang et al., 2020	
		- Learner-centered teaching, learning methods and assessments			
- Creative experience activities organization and operation					

basic curriculum in terms of evaluation criteria achievement standards and evaluation standards designed to ensure the quality of special education (Kang et al., 2020). In addition to discussions about fundamental aspects of the basic curriculum, some researchers have maintained that, despite the fact that it is important to have students with hearing impairment participate in general education, the common curriculum has somewhat failed to consider special conditions of students with hearing impairment. In particular, they argued that, given the trend of the increasing number of students with severe or multiple disabilities at schools for the hearing impaired, it is necessary to review and discuss the appropriateness of subject content standards and subject organization to reflect student levels and needs (Gwan, 2016, 2017).

Perception and status of curriculum application

Analysis of research examining the perception and status of curriculum application showed that, although teachers were not highly interested in curricula as such, they requested reorganization of the curriculum and had difficulties in applying learner-centric teaching, learning, and evaluation as emphasized by the 2015 revised special education curriculum. There has also been research investigating organization and implementation of creative activities in visually impaired and hospital schools. First, both special education schools that apply the basic curriculum and teachers have reported no interest in the special education curriculum (Song and Choi, 2019a). Although some differences have been caused by teachers' careers and so on,

they have been implementing it mechanically (Song and Choi, 2019b).

Second, although there has been a keen awareness of the need for curriculum restructuring, there have been no systematic approaches, procedures, or methods outlined for curriculum reorganization (Park J. S., 2017). Such insufficient understanding of the curriculum (Yang, 2018) has caused difficulties for most teachers (Kim and Jeong, 2019). Moreover, although achievement standards were adjusted downward from those of the previous curriculum, they were still too difficult. Because descriptions were unclear, more concrete and segmented achievement standards were still needed (Park Y. M., 2017; Kim and Yoo, 2020; Lee, 2020). These studies (Park Y. M., 2017; Kim and Yoo, 2020; Lee, 2020) confirmed that the curriculum was not appropriate for the characteristics and level of special needs students. Therefore, reorganization of the curricula at schools is urgent. Some studies have indicated that, for students with severe or multiple disabilities, the subject curriculum has no meaning. Hence, the curriculum needs to be revised in such a way that subject organization and number of hours on the curriculum can be flexibly discussed and adjusted (Kim and Yoo, 2020).

Third, for learner-centric teaching, learning, and evaluation emphasized by the 2015 revised special education curriculum, special education school teachers have found it difficult to apply instruction and learning methods. They indicated difficulty in adjusting evaluation standards (Park and Kang, 2017). Results of these studies (Park and Kang, 2017; Kim and Yoo, 2020) showed that, depending on characteristics of student's subject to the curriculum, teachers had difficulties in different areas. Moreover, regarding the perception and status of organization and implementation of creative activities in visually impaired and hospital schools, various creative experiences and activities that cannot be learned in subjects can be composed to meet characteristics and levels of students' disabilities. However, in reality, in schools for visually impaired, the curriculum did not include various activities in a way that was appropriate for characteristics of disabilities, with hospital schools requiring more diverse programs and materials.

Analysis of research on the basic curriculum by subject

There were 27 studies on subject curriculum. All of them dealt with subjects of the basic curriculum. There were four articles that compared the basic curriculum and the common curriculum. However, no research examined the common curriculum and elective-centered curriculum of the 2015 revised special education curriculum. For the basic curriculum, there was at least one article for each subject. However, because there

were few articles for a specific subject, it was difficult to assess the propriety of subject implementation. Subject research by curriculum type is detailed in Table 3. Here, research content was listed by subject and implications. Issues by research topic of subjects are listed in the section "Discussion."

Korean (four articles)

There were four articles on Korean language as a subject that discussed future directions for Korean education, the propriety of achievement standards, and the feasibility of core competence. Korean language as a subject in the basic curriculum should consider characteristics of students subject to the curriculum and reflect universality of the subject as well as various instructional and learning methods emphasized by general education. Lee (2017) has maintained that various issues of instruction for Korean language (such as language education, focus of text reception and production, process-focused instruction, integrated language education, whole-language approach, activity-centered language instruction, and self-directed learning) should be accommodated and adjusted into instruction in Korean in the basic curriculum. Although it is important to reflect such current issues, for Korean language as a subject, the appropriateness of curriculum elements such as core competence and achievement standards that constitute subject content is critical. Currently, the core competence of the Korean language as a subject has been mentioned as a general cognitive ability. However, connectivity with other subjects is missing. Therefore, we must study the feasibility of instruction in Korean language as a subject using various research methods (Gwan H. Y., 2019). In the same context, if core competence is conceptualized and described by giving too much importance to general cognitive ability, achievement standards will likely consist of knowledge dimensions and cognitive processes that require both factual and conceptual knowledge. An (2019) has stressed the need for a curriculum and achievement standards to consider procedural knowledge and meta-cognitive knowledge for special-needs children in terms of knowledge dimension.

Mathematics (three articles)

For mathematics, there were studies regarding connectivity with the common curriculum, perception of content system through mathematics instruction experience, or performance level of achievement standards, which are so high that special needs students with intellectual disabilities can hardly achieve them. Therefore, there is a need for overall adjustment of achievement standards (Kim Y. C., 2019). Some scholars have stated that although there is a need to lower the level of difficulty of mathematics in the basic curriculum to the level of special needs students of special education schools that use the basic curriculum, linkage to the common curriculum should be increased for the sake of integrated education (Lee P. S., 2019). However, others

TABLE 3 Contents of basic curriculum subjects.

Curriculum type	Subjects	Research content	Number of studies	References
Basic curriculum	Korean	Direction of Korean education	4	Lee, 2017; An, 2019; Gwan H. Y., 2019; Lee G. C., 2019
		Adequacy of Korean achievement criteria		
		Validity of core competencies in Korean		
	Math	Connection with common curriculum math	3	Jeong, 2018; Kim Y. C., 2019; Lee P. S., 2019
		Performance level for achievement criteria		
		Awareness and teaching experience in math content system		
	Social studies	Direction of social-studies education	4	Han and Park, 2016; Han and Jeon, 2017; Park J. S., 2017; Choi and Lee, 2020
		Suitability of social-studies curriculum		
		Direction of social-studies curriculum composition		
	Science	Suitability of achievement criteria	2	Son and Jeong, 2019; Song et al., 2020
	Music	Curriculum change review	4	Min, 2017; Shin et al., 2017; Won, 2018; Gwan J. O., 2019
		Curriculum development direction and highlights		
		Connection of achievement criteria by grade group		
	Art	Curriculum adequacy	2	Park J. S., 2017; Lee and Jeon, 2018
		Curriculum adequacy	3	Jeong and Jeong, 2016; Park Y. M., 2017; Lee and Jeon, 2018
	Integrated curriculum	Curriculum development process review	1	Jeong, 2016; Son, 2018; Lee and Lee, 2019
		The concept of thematic composition review		
		Curriculum execution experience		
	Practical course	Comparison with common curriculum	1	Kim J. Y., 2019
		Cross-curriculum connection analysis	1	Song, 2019
Practical course future career and occupation				
Other (multiple subjects)	Analysis of sex education content of secondary-school curriculum achievement standards	1	Chung and Han, 2017	
Using information and communications	Accountability analysis of content structures and achievement criteria	1	Yoo and Choi, 2019	
	Total	27		

have stated that, for special education students attending integrated classes, teachers of integrated classes should have specialized knowledge and views on the basic curriculum and present a practical lesson plan and learning activities (Jeong, 2018). Thus, depending on students in the basic curriculum and learning environment, there have been different views on the direction of mathematics in the basic curriculum.

Social studies (four articles)

Research on social studies showed that, depending on one's views regarding targets of the curriculum, there are various

discussions on the propriety of the curriculum. First, for targets of the 2015 basic curriculum's social-studies subject, researchers have stated that whether goals or levels of subject content are suitable for students with severe or multiple disabilities should be studied (Han and Jeon, 2017). For mentally handicapped students or students with severe or multiple disabilities, it is important to design a curriculum focusing on life (Han and Park, 2016). Other scholars have assessed the propriety of the basic curriculum from different perspectives. They stated that citizen empowerment or global citizenship education, which should have been included in social studies, was not fully reflected in the basic curriculum (Park J. S., 2017; Choi and Lee, 2020).

Science (two articles)

Studies on science subjects covered content analysis of achievement standards and surveyed the importance and propriety of achievement standards centered on both factual and conceptual knowledge as in mathematics. The cognitive process was focused on understanding (Son and Jeong, 2019), which presented ways to improve description of achievement standards, stating that methods and learning contents of achievement standards should be provided to improve understanding of achievement standards and facilitate their reorganization into class activities. A survey of how special education teachers perceive importance and propriety of achievement standards found that they placed more importance on achievement standards related to real life, but placed less importance on achievement standards with theoretical contents (Song et al., 2020). Because the propriety of achievement standards was higher when they were more related to real life, contents and achievement standards for science need to mostly consist of practical science topics that can be applied to real life.

Music, fine arts, and physical education (nine articles)

Research on subjects of music, fine arts, and physical education examined whether the subject area and achievement standards of the basic curriculum were appropriate for students with severe or multiple disabilities. Scholars have argued that, for music, because it takes many hours and substantial effort to learn how to play music, it is necessary to develop a basic curriculum for music while considering disability type and level (Won, 2018; Gwan J. O., 2019). Although subject areas, content elements, and achievement standards for music were presented properly by school-year group, they might need to be composed in the form of a spiral curriculum (Shin et al., 2017).

For fine arts, subject competence did not have identity of the basic curriculum. Subject competence of fine arts subject of the common curriculum was partially applied. The number and level of achievement standards were also inappropriate for students. They were improper overall (Son, 2018). Some scholars have argued that subject contents and core competence of fine arts are partial extraction of subject content of the common curriculum or simply a downward adjustment of achievement standards of the common curriculum (Son, 2018). Others have stated that although subject area and the content and level of achievement standards for physical education have been adjusted, they are just downward adjustments of achievement standards of the common curriculum. Therefore, achievement standards should be adjusted while considering characteristics of students with intellectual disabilities (Lee and Jeon, 2018). In conclusion, goals and achievement standards for music, fine arts, and physical education were not developed by considering characteristics of students subjected to the basic curriculum, but by performing simple downward adjustments of goals and achievement standards of the common curriculum.

Therefore, it is necessary to review the propriety of these contents. Curriculum for arts education lesson begins from the expression of lines class. What has changed in aims of study is that it now focuses on student's individual abilities.

Integrated subject (one article)

The integrated subject curriculum focuses on direct experience of thematic activities. It was developed to promote instruction focusing on students' natural experience, practice, exploration, and expression and to evaluate their experience, performance value, and meaning of real-life-related themes (Jeong and Jeong, 2016). It also includes concepts that support themes of integrated subjects with implications for special education, such as possibility of an integrated subject as a universal curriculum design, promotion of class activities that can strengthen student performance, provision of principles for teachers' class reorganization, and offering of educational experience suitable for student's age (Jeong, 2016). However, teachers who implemented the integrated subject curriculum said that it contained themes not related to real life. They found it difficult to equally apply achievement standards by school year group to students with diverse educational needs (Lee and Lee, 2019). Hence, the propriety of themes of the integrated subject should be reviewed. In particular, it is necessary to strengthen the process and methods of collecting opinions of teachers. It is also necessary to investigate difficulties in reorganizing the integrated subject curriculum into school curriculum, school-year curriculum, and class curriculum. Efforts are needed to increase suitability of the integrated curriculum of schools.

Others (three articles)

The curriculum hierarchy and sequence are important principles of organizing educational contents and standards for reviewing the propriety of the curriculum. Cross-curriculum relevance is another principle of curriculum development. In the 2015 revised special education curriculum, researchers have examined the hierarchy, sequence, cross-curriculum relevance of content in practical courses in career/occupation, and the use of telecommunication. Studies of such courses in the basic curriculum presented views indicating that, for the sake of integrated education, practical courses of the basic curriculum need to conform to practical courses of the common curriculum in terms of content area and core competence. Purposes and goals of the curriculum should also be clear and specified (Kim Y. C., 2019). However, because practical courses of the basic curriculum aim to be relevant to those in the middle-school curriculum, they need to be compared with career/occupation courses in the basic curriculum instead of the common curriculum. Studies comparing practical courses in the career/occupation of the basic curriculum showed that both subjects emphasized the same competence and considered stages of career development, such as career recognition, career,

and career preparation. However, it was difficult to see hierarchy in terms of vocabulary diversity and difficulty of achievement standards between subjects (Son and Jeong, 2019). The use of telecommunication, an elective subject of the basic curriculum, lacks connection between subject's goals and achievement standards, thus necessitating a hierarchical reorganization (Yoo and Choi, 2019).

Discussion

The aim of this study was to analyze research conducted after the 2015 revision of the special education curriculum in Korea to present implications and directions for future revisions of the curriculum. To this end, we analyzed contents of studies published in domestic journals or dissertations for a degree from 2016 to present. We conducted the analysis by dividing research themes into national curriculum standards and subject curriculum. We found that studies on national curriculum standards discussed curriculum development and direction, along with perception and status of curriculum implementation, whereas studies on subject curriculum discussed the basic direction of curriculum and the content propriety of subjects as follows.

Studies on national curriculum standards

Research on national curriculum standards of the 2015 revised curriculum included six studies on curriculum development, organization, and direction and 11 studies on the perception and status of curriculum implementation.

First, we discussed curriculum development and organization. Korea's curriculum is a national-level curriculum developed by curriculum specialists under the supervision of the Ministry of Education, which conducts basic research to prepare for curriculum revision. In this process, opinions of teachers at schools are collected, open forums and public hearings are held, and the revised curriculum is then announced.

There was only one study on curriculum development. It stated that, because there was too little time to prepare the revised special education curriculum, the collection of opinions of school teachers was not adequate and the research on and discussion of the curriculum was insufficient. Thus, it is necessary to address such deficiencies (Lee et al., 2017).

The Ministry of Education entrusted the National Institute of Special Education with the development of national curriculum standards and subject curriculum for the 2015 revised special education curriculum (Korean National Institute of Special Education, 2014, 2015, 2016). In this process, specialists of the National Institute of Special Education faced difficulties caused by a lack of understanding of the special

education curriculum by the Ministry of Education and a lack of effective communication with specialists in the national curriculum standards of the 2015 who revised the curriculum for elementary, middle, and high schools (Jeon, 2018). Although the Ministry of Education has done basic research for a long time by investing many financial resources and much time toward the revision of the curriculum for elementary, middle, and high schools, basic research on special education curriculum revision was entrusted to the National Institute of Special Education according to the curriculum revision plan of the Ministry of Education. Beginning with the revision of a national-level curriculum in 2015, the curricula for elementary, middle, and high schools and for special education have been revised simultaneously. It is, therefore, essential to assign specialists majoring in special education to the Ministry of Education as it is the implementer of special education curriculum development. It is essential to have the attention and support of the Ministry of Education for special education.

The absence of basic research into and discussion of the curriculum led to difficulties in setting the basic direction for curricula, such as feasibility of core competence of the basic special education curriculum and the necessity for improving goals of the basic curriculum and subject system. Core competence is the most important educational philosophy in the 2015 revision of the curriculum for elementary, middle, and high schools. It was accepted without criticism in the course of special education curriculum development. Therefore, the feasibility of core competence in the basic curriculum for special education needs to be reviewed and reconceptualized (Oh and Kang, 2019). Moreover, studies have pointed out that the goals and subject system of the basic curriculum are not effective in providing systematic guidance on functional life skills to students with severe or multiple disabilities who represent the main target of the curriculum (Jeon et al., 2018; Baek, 2019; Kim and Yoo, 2020). Therefore, Baek (2019) has proposed changes in goals, subject composition system of the basic curriculum, and creation of ecological life-related areas. The facts that studies have raised the need to improve basic elements of the curriculum such as its core competence, goals, and subject composition system as such elements are related to the identity of the basic curriculum. It is accordingly necessary to have an open discussion about the core competence, targets, goals, and subject composition system of the basic curriculum in the course of curriculum development. Since the Act on Special Education for Persons with Disabilities provides support for the subject composition system, its connection with the revision of the Act might need to be reviewed, which is currently under investigation.

Recently, the national curriculum standards of the 2015 revised curriculum regarding the implementation of a national-level curriculum specified that the quality of learning should be improved by structuring the learning content and optimizing the volume of learning with a focus on the core concept

of subjects. However, in reality, it is difficult to say that such an intention is faithfully realized in the development of subject curriculum. Concerning this issue, some scholars have stated that basic research that coordinates viewpoints on national curriculum standards and subject content composition in the subject curriculum is needed for the next curriculum development (Hong et al., 2020). Curriculum clarity is relevant for national curriculum standards, subject curriculum, textbooks, classes, and evaluation (Jeon, 2018). The divergence between national curriculum standards and the subject curriculum has been indicated in the literature. Specifically, the lack of relevance between educational goals and subject goals in the national curriculum standards has been pointed out. The divergence between subject curriculum and evaluation has also been reported (So, 2000; Kim and Kang, 2009; Kim and Kim, 2017). In this connection, some scholars have stated that a simplified curriculum is needed to promote curriculum localization and autonomy by minimizing intervention or regulations in the curriculum (Lee, 2013; Lee S. L., 2019; Lee S. M., 2019). In particular, it is necessary to simplify the special education curriculum to preserve flexibility in the education of students with special education needs who have diverse individual differences.

Meanwhile, when implementing school curriculum, instructional content and function must be evaluated based on achievement standards for each subject. Moreover, testing accommodations must be provided according to characteristics and levels of disability. In this context, Kang et al. (2020) have argued that a specific guideline should be urgently prepared by developing related cases. Most studies (Hong et al., 2020; Kang et al., 2020) were focused on the basic curriculum. It was difficult to find studies related to the common curriculum. There were two studies on the common curriculum (Gwan, 2016, 2017). They stated that subject level and contents should be reviewed to make them appropriate for students with severe or multiple disabilities. The common curriculum is largely intended for students with hearing and visual impairment or physical disabilities without intellectual disabilities. As the number of students with severe or multiple disabilities is increasing, a separate common curriculum needs to be developed or standards allowing for flexibility in implementing the common curriculum need to be prepared.

Second, there were 11 studies about the perception and status of special education curriculum implementation. Special education teachers were less interested in curriculum (Song and Choi, 2019a). Special education schools applied the basic curriculum mechanically (Song and Choi, 2019b). Teachers' lack of interest in the curriculum and its mechanical implementation may be explained by some research on curriculum reorganization. Most teachers believed that reorganization is essential to make the curriculum fit for the specific levels of students or integrate subjects with a

focus on competence. However, because teachers are not systematic in implementing curriculum, concrete support, such as the provision of training sessions to promote teachers' understanding of the curriculum implementation, should be offered (Park J. S., 2017; Yang, 2018; Kim and Jeong, 2019; Kim and Yoo, 2020; Lee et al., 2020).

Issues such as teachers' lack of interest in curriculum and their difficulty in curriculum reorganization have been continuously raised. They were apparent in the curriculum status survey of the National Institute of Special Education (Jeon et al., 2018). They were also pointed out in previous studies (Gwan and Chang, 2008; Oh, 2014; Kim et al., 2016). The low interest of special education teachers in the special education curriculum could be partially attributable to the low participation of teachers in the curriculum development phase (Jeon et al., 2018). Curriculum reorganization might represent the fundamental issue of special education. Reinterpreting existing curriculum reorganization and reorganizing it to the level of individual students are not easy. Difficulty in curriculum reorganization might result from teachers' lack of knowledge about competence (Yang, 2018). Understanding of curriculum should not be limited to acquisition of knowledge about curriculum. Teacher training should focus on expanding curriculum literacy necessary for curriculum reorganization and implementation (Jeon et al., 2018). Accordingly, teacher retraining sessions such as Grade 1 teacher training related to special education have included contents to cultivate ability to reorganize curriculum. However, special education teachers still find it difficult to reorganize the curriculum. Thus, concrete measures are urgently needed.

Research on subject curriculum

The special education curriculum consists of common curriculum, basic curriculum, and elective-centered curriculum. There were 27 articles about subject curriculum. They all dealt with subjects of the basic curriculum. There were four studies that compared the basic curriculum with the common curriculum. However, no research dealt with the common curriculum or elective-centered curriculum of the 2015 revised special education curriculum. Regarding the basic curriculum, there was at least one article for every subject. However, since there were only a few studies for each subject, it was difficult to assess the overall status and propriety of subject implementation.

There were almost no research articles comparing the common curriculum and the elective-centered curriculum. This might be attributable to the presence of fewer students with sensory disabilities than with developmental disabilities, a shortage of teachers who had majored in special education, and little interest in subject instruction. Sensory disabilities can

involve any of the five senses. For educational purposes, it generally refers to a disability related to hearing, vision, or both hearing and vision. Sensory disabilities affect access to visual and/or auditory information. Hence, for studies on the subject curriculum of the special education curriculum, we will discuss basic direction of the curriculum and the propriety of subject content with a focus on the basic curriculum.

Basic direction

First, we must examine whether basic direction of the basic curriculum properly reflects the purport of national curriculum standards. As mentioned earlier, researchers have conducted basic research to coordinate views on national curriculum standards and subject curriculum concerning subject content composition methods in the course of curriculum development (Hong et al., 2020).

An important rationale for designing curriculum content is the philosophy of the national education revision and goals of subjects (Lee and Jeong, 2017). The 2015 curriculum for elementary, middle, and high schools contained core competence to realize humanitarian ideals and intended to teach these in all subject instructions. However, it is not certain how much of these points are taught in each subject. Although each subject curriculum has achievement standards, there is no empirical discussion on achievement standards or core competence (Kim, 2016). When developing the subject curriculum of the 2015 revised special education curriculum, all achievement standards were required to be described by considering core competence of each subject. However, in reality, in most cases, achievement standards were first presented and merely connected to core competence by subject without concrete discussion (Jeon et al., 2018).

Therefore, it is necessary to examine whether objectives of subjects of the basic curriculum are properly established to reflect the spirit of national curriculum standards. Core competence by subject is an important element that affects objectives of subjects. The study of Gwan H. Y. (2019) was the only article that addressed such an issue. It stated that, because the Korean language as a subject only lists cognitive ability as its core competence, the significance of competence has faded and the feasibility of core competence needs to be reviewed. Assessing the feasibility of core competence was also mentioned by studies on core competence of national curriculum standards (Oh and Kang, 2019). There is a need to perform systematic feasibility studies for establishing core competence in special education and subject competence of the basic curriculum. Meanwhile, research on social studies showed that perspectives could depend on objectives of subject curriculum.

Second, research was conducted on objectives of the subject curriculum. These were articles concerning the direction of future curriculum development and education. There were two studies on integrated subjects and one study about music. Development of the integrated subject curriculum showed that the 2015 revised curriculum development aimed at

convergence and connection between subjects and within a subject (Lee and Jeong, 2017). The integrated subject curriculum is a good example of subject convergence and connection. The development of integrated subjects bears educational significance in that it allows teachers to consider the concept of theme organization, strengthen students' class performance, and help teachers learn the principle of class reorganization in terms of actual applications of the curriculum at schools (Jeong, 2016).

However, teachers faced difficulty in planning classes to meet requirements of integrated subjects (Lee and Lee, 2019). This might be attributable to the fact that teachers were not trained in subject convergence or cross-curriculum relevance. In addition, teachers were less experienced in planning teaching and learning activities in classes.

Subject content organization is related to subject goals, content system by school year, and achievement standards. It is very important for learners because it is used as standards for developing textbooks for subjects. However, there were only three articles about this. Han and Park (2016) have examined the effect of convergence education using a life-centered context in social studies of the basic curriculum in the 2015 special education curriculum. They particularly stressed the importance of education related to the life of students with severe or multiple disabilities. On the other hand, some researchers have stated that social studies as a subject of the special education curriculum cover too little contents on global citizenship, although it should be considered as one of its fundamental objectives (Park J. S., 2017; Choi and Lee, 2020). This implies that the objective of subject education could depend on persons who perform the curriculum implementation. The educational content of a subject can be divided into absolute standards that consider characteristics of the subject and relative standards that consider characteristics of learners (Kim and Byun, 2002). Hence, directions and goals of the basic curriculum depend on which standards they rely on. Therefore, further discussions on these standards are needed.

Propriety of content

The propriety of subject content is highly considered in relation to achievement standards. It often becomes an issue at the time of curriculum revision. The concept of the propriety of subject content is diverse. It is related to the "quantity and level" of educational content. Most studies have dealt with the "level" of educational content. The outcome of educational content is directly related to the content of textbooks on subjects regarded as being the outcome of subject curriculum implementation. Because educational content can be adjusted in a realistic manner (Lee, 2020) to deal with variables of learners, teachers, and instructional conditions, it is very important in the development of a subject curriculum. The literature on the propriety of subject content included six articles about the propriety of achievement standards, nine articles that compared the content between curricula, and two articles about the experience of curriculum implementation.

First, studies on the propriety of achievement standards focused on teachers' instructional experience about achievement standards by subject, including an article on teachers' perception of the importance and propriety of achievement standards (Lee and Jeon, 2018; Song et al., 2020) and one study on the performance level of students (Kim Y. C., 2019). They found that, despite difference in subjects and research objects, levels of all achievement standards for mathematics, science, and physical education needed to be adjusted downward in consideration of performance levels of students. For science, if the content of achievement standards was closer to life, then teachers perceived higher importance and propriety (Song et al., 2020). Moreover, if the content of the achievement standards for science and Korean as a subject was classified according to Bloom's revised taxonomy of educational objectives, their achievement standards demanded acquisition of simple knowledge and cognitive processes instead of using meta-cognitive knowledge (An, 2019; Son and Jeong, 2019). These studies (Lee and Jeon, 2018; An, 2019; Kim Y. C., 2019; Son and Jeong, 2019; Song et al., 2020) suggest that studies on the propriety of achievement standards should be conducted with more diverse levels and aspects of achievement standards by subject. Ultimately, the propriety of establishing subdomains by subject of the basic curriculum needs to be reviewed. To ensure more systematic research, although individual studies are important, the National Institute of Special Education, which is responsible for developing curriculum and textbooks, needs to be the main entity that conducts a systematic and continuous study of the propriety of content, considering that policy research by subject in the general education curriculum is conducted under the supervision of the Ministry of Education.

Second, there are studies on subject contents using curriculum comparison. Comparative analyses of the curriculum included an analysis of the relevance between previous and current versions of the curriculum, between the common curriculum and the basic curriculum, between subjects of the basic curriculum, or between achievement standards of a subject.

When the 2011 revised curriculum was compared with the 2015 revised curriculum, it was found that, although the area, content elements, and the number and level of achievement standards were adjusted properly for some subjects to meet the intention of the revision, core competence was not appropriate for other subjects as the number of achievement standards was under adjusted, thus requiring a comprehensive review of their propriety. Hence, further studies are needed on the propriety of subject contents in multiple aspects. Based on results of these studies, the direction for the next curriculum revision may be discussed. Moreover, a review of whether the subject content of the basic curriculum is appropriate for students with severe or multiple disabilities is needed. Researchers have proposed the necessity for studies on the relevance of individualized education programs for these students (Han and Jeon, 2017;

Park J. S., 2017; Son, 2018; Won, 2018; Gwan H. Y., 2019). On the other hand, some researchers have stated that, for the sake of integrated education, areas and contents of the basic curriculum should be adjusted to become more relevant to or identical to those of the common curriculum (Jeong, 2018; Kim Y. C., 2019). These research results suggest that the direction of curriculum revision can depend on targets of the basic curriculum. The survey on the use of the special education curriculum by the Korean National Institute of Special Education (2014) found that respondents had difficulty in applying the curriculum because targets of the basic curriculum implementation were not clearly defined.

Third, some studies have explored the curriculum propriety based on experience with curriculum implementation. Lee P. S. (2019) has stated that, in mathematics, the area of "numbers and calculation" needs to be strengthened and that its difficulty level needs to be adjusted. Lee and Lee (2019) have found that the integrated subject contains topics that do not properly reflect real-life situations. Because teachers deal with students at different levels, they could not implement the curriculum as it is written. They found that it was difficult to reorganize the subject content as needed. As mentioned previously, researchers have said that curriculum reorganization training should be conducted through active research that reveals specific implementation processes and stages.

To summarize the literature, most studies on content propriety of the basic curriculum are either literature studies or surveys of perceptions of teachers who are experienced instructors. Thus, studies on the performance level by subject with a focus on students who learn under a subject curriculum are needed. Research on the propriety of subject content based on students' performance done by observing actual classes will produce important findings. However, there are very few studies on the content propriety of the basic curriculum.

Therefore, it is difficult to make a judgment on whether subject contents are appropriate for students who are subjects of the curriculum.

To understand why research on the revised special education curriculum is necessary, we reviewed the literature as follows.

Curriculum is closely related to the curriculum implementation at scenes of special education (Qomari, 2016). Curriculum implementation is the duty and role of teachers (Prasetyono et al., 2021). To achieve quality curriculum implementation at schools, exploring research on curriculum is important (Zhang and Zhang, 2012; Kazempour and Abar, 2018; Luo, 2018).

Teacher knowledge is related to curriculum literacy in curriculum implementation (Akyıldız et al., 2018). In other words, teacher knowledge needs to be focused on reading and interpreting curriculum. As was the case in the literature (Ruth and Ramadas, 2019; Figa et al., 2020; Bunting, 2021;

Sarafadeen, 2021; Zucker et al., 2021), we found that teacher knowledge was closely related to curriculum implementation. In other words, previous studies have suggested that teacher knowledge is a teacher variable related to curriculum implementation.

Learning motivation is a core element for students to participate in learning activities (He, 2020; Wrastari, 2020), which is one of the factors that must be considered in curriculum implementation (Kristiyani and Budiningsih, 2019; Shuhaibah et al., 2022).

In this study, as was shown in the literature (Druzhinina et al., 2018; Chen, 2020; Hayati et al., 2020; Ludovikus and Yulia, 2021), we found that learning motivation was another factor that could significantly affect curriculum implementation.

Next, instruction supervision is based on coaching by schoolmasters or related specialists in order to improve teachers' ability to implement curriculum (Saad, 2019). As in the literature (Chaudhary, 2015; Chepkuto et al., 2018), we also found that instruction supervision improved curriculum implementation.

Variables in this study, such as teacher knowledge, learning motivation, instruction supervision, and curriculum implementation, only recently began to attract attention. Thus, related studies are insufficient. However, this study was still meaningful in that we tested a structural model of variables related to special education curriculum implementation in Korea. In addition, we conducted an empirical test and found that curriculum implementation in Korea's special education scenes was affected by variables of curriculum implementation, reflecting unique characteristics of Korean culture.

In addition, with growing social and educational interest and needs for intervention in curriculum implementation by special education teachers, this study is significant in that it provides basic materials necessary to promote understanding of special education teachers about curriculum implementation and to improve capabilities of teachers in implementing the special education curriculum in Korea.

Given our results, ways to increase teacher knowledge, learning motivation, and instructional supervision need to be explored to improve the quality of Korean special education teachers' curriculum implementation. This study is also significant in that, by analyzing contents of Korea's 2015 revised special education curriculum, it publicizes information on Korea's unique special education curriculum among specialists of special education in the world, which is expected to help

stakeholders recognize the importance of special education and curriculum implementation from an international perspective. A limitation of this study was that this research was based on content analysis of Korea's unique special education curriculum. To overcome this, we compared our results with international studies on curriculum implementation.

Conclusion

South Korea is currently attempting to revise the 2022 revision of the special education curriculum. Directions for such revision are as follows: (1) Curriculum suitable for needs of individuals who are subjected to special education, (2) Curriculum organization and operation to support students placed in general schools, (3) Expanding autonomy in the curriculum for students with moderately overlapping disabilities, (4) Creating conditions for integrated education, (5) Securing identity of the basic curriculum, and (6) Providing vocational education considering the future of students.

Author contributions

OC and BJ contributed to the conception and design of this study, data interpretation, and involved in data acquisition. Both authors approved the manuscript for submission.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Akyıldız, S., Altun, T., and Kasım, Ş (2018). Classroom teacher candidates' comprehension levels of key concepts of the life science curriculum. *J. Educ. Train. Stud.* 6:121. doi: 10.11114/jets.v6i9.3354

An, S. H. (2019). *Analysis of Korean subject achievement standards in the 2015 revised special education basic curriculum*. Ph.D. thesis. Dageu: Graduate School of Education, Dageu University.

- Baek, S. J. (2019). A study on the change of special education basic curriculum in Korea: focusing on the educational goals and composition system. *Spec. Gift. Educ.* 6, 119–138. doi: 10.33125/kdps.2019.6.2.8
- Bahrum, S., Wahid, N., and Ibrahim, N. (2017). Integration of STEM education in Malaysia and why to STEAM. *Int. J. Acad. Res. Bus. Soc. Sci.* 7, 645–654. doi: 10.6007/IJARBS/v7-i6/3027
- Bettini, E. A., Crockett, J. B., Brownell, M. T., and Merrill, K. L. (2016). Relationships between working conditions and special educators' instruction. *J. Spec. Educ.* 50, 178–190. doi: 10.1177/0022466916644425
- Bunting, C. (2021). The role of teacher educators in supporting STEM curriculum reform - lessons from New Zealand. *J. Phys. Conf. Ser.* 1835:012001. doi: 10.1088/1742-6596/1835/1/012001
- Chaudhary, G. K. (2015). Factors affecting curriculum implementation for students. *Int. J. Appl. Res.* 1, 984–986.
- Chen, T. H. (2020). "A study on e-learning course certification indicators applied to curriculum design," in *Proceedings of the 3rd Eurasian Conference on Educational Innovation 2020 (ECEI 2020)*, Hanoi, 55–58. doi: 10.1142/9789811228001_0013
- Chepkuto, W. K., Sang, J., and Chumba, S. (2018). Influence of continuous professional development programs on curriculum implementation in selected north rift counties public secondary schools. *Kenya. Int. J. Educ. Res* 6, 169–182.
- Choi, J. H., and Lee, D. S. (2020). Analysis of contents of global citizenship education according to the 2015 revised special education curriculum Focus on social studies curriculum. *J. Learn. Cent. Curric. Instr.* 20, 771–790. doi: 10.22251/jlcci.2020.20.11.771
- Chung, S. K., and Han, K. G. (2017). Analysis on contents of sexuality education in achievement standards of the 2015 revised basic curriculum for secondary schools. *J. Spec. Child. Educ.* 19, 171–195.
- Demirbilek, M., and Talan, T. (2022). "Integrating assistive robotics in 'STEM' education to empower people with disabilities," in *Designing, Constructing, and Programming Robots for Learning*, eds N. Eteokleous and E. Nisiforou (Hershey, PA: IGI Global), 179–200. doi: 10.4018/978-1-7998-7443-0.ch009
- Druzhinina, M., Belkova, N., Donchenko, E., Liu, F., and Morozova, O. (2018). "Curriculum design in professional education: theory and practice," in *Proceedings of the SHS Web of Conferences*, Vol. 50, (Les Ulis: EDP Sciences), 1046. doi: 10.1051/shsconf/20185001046
- Figá, J. G., Tarekegne, W. M., and Kebede, M. A. (2020). The practice of formative assessment in Ethiopian secondary school curriculum implementation: the case of west arsi zone secondary schools. *Educ. Assess.* 25, 276–287. doi: 10.1080/10627197.2020.1766958
- Gwan, H. Y. (2019). Study on the feasibility of core competence of basic curriculum Korean subject. *J. Spec. Educ. Rehab.* 23, 25–38.
- Gwan, J. O. (2019). A study on the change of basic music curriculum for elementary school in special education: focusing on Korean traditional music. *J. Spec. Educ. Curric. Instr.* 12, 117–133. doi: 10.24005/seci.2019.12.4.117
- Gwan, J. S., and Chang, D. J. (2008). Relationship between special education class teachers' perception of curriculum reorganization, practical knowledge, and level of implementation. *J. Spec. Child. Educ.* 10, 195–212. doi: 10.21075/kacsnc.2008.10.4.195
- Gwan, S. H. (2016). The study on the appropriateness of the deaf curriculum along its historical change. *Study Educ. Hear. Lang. Impair.* 7, 1–21.
- Gwan, S. H. (2017). A study on the optimization of appropriate hearing-impaired curriculum. *J. Educ. Innov. Res.* 27, 127–148. doi: 10.21024/pnuedi.27.4.201712.127
- Han, H. S., and Jeon, B. U. (2017). Content analysis of social studies in 2011 and 2015 basic special education curriculum. *J. Spec. Educ. Rehab.* 22, 73–95.
- Han, K. G., and Park, G. B. (2016). Life centered convergence curriculum design in the basic curriculum of 2015 special education. *Soc. Stud. Educ.* 55, 105–114.
- Hayati, N., Marlita, L., and Waluyo, E. (2020). Learning device development with cooperative model of productive creative type to improve students' motivation. *J. Phys. Conf. Ser.* 1539:012049. doi: 10.1088/1742-6596/1539/1/012049
- He, J. (2020). Construction of "three-stage asynchronous" instructional mode of blended flipped classroom based on Mobile Learning Platform. *Educ. Inf. Technol.* 25, 4915–4936. doi: 10.1007/s10639-020-10200-9
- Hong, E. S., Lee, K. Y., Hwang, G. H., and On, J. D. (2020). Exploration of tasks to coordinate the perspectives on how to present content. *J. Educ.* 40, 1–29. doi: 10.25020/je.2020.40.3.1
- Jeon, B. U. (2018). "Problems with special education curriculum implementation and tasks for practice," in *proceedings of 2018 Korean Society of Special Education, spring conference materials*, 20–47.
- Jeon, B. U., Choi, S. B., Seo, H. J., Ham, M. A., and Lee, J. S. (2018). *Study on the Status of the Application of the 2015 Revised Special Education Curriculum*. Asan: National Institute of Special Education.
- Jeong, H. J. (2018). *The Analysis of Relevance Between the Middle School Mathematics of 2015 Basic Curriculum and Mathematics of Common Curriculum 3rd and 4th Years*. Master's thesis. Daegu: Daegu University.
- Jeong, J. Y. (2016). The study of constructs on theme of integrated curriculum in the 2015 basic curriculum of special education. *J. Incl. Educ.* 11, 249–280. doi: 10.26592/ksie.2016.11.2.249
- Jeong, J. Y., and Jeong, Y. J. (2016). The study of Integrated curriculum development process in the light of development process of "Disciplined life" curriculum in the 2015 basic curriculum of special education. *J. Intellect. Disabil.* 18, 1–33.
- Kang, E. Y., Park, G. O., Park, N. S., Park, E. H., Lee, E. G., Park, J. M., et al. (2020). Exploring the direction of establishment of achievement criteria and evaluation criteria based on reinterpretation of basic curriculum achievement Standards. *Phys. Mult. Health Disabil.* 63, 135–163.
- Kazempour, E., and Abar, H. (2018). Providing core curriculum model for second grade of high school. *Eur. J. Behav. Sci.* 1, 54–65. doi: 10.33422/EJBS.2018.05.31
- Kim, D. H., and Yoo, E. J. (2020). Perception of elementary special education teachers on adoption of 2015 national special education curriculum. *J. Spec. Child. Educ.* 22, 73–101.
- Kim, D. I., and Jeong, E. H. (2019). A study on understanding of education curriculum and recognition and practice of special education curriculum reconstruction of special education teachers. *Study Educ. Hear. Lang. Impair.* 10, 103–124.
- Kim, D. J., and Kim, S. Y. (2017). A study on curriculum implementation standards: influencing factors and curriculum implementation standards, Korea's curriculum implementation practices and tasks for their improvement. *J. Educ. Cult.* 23, 37–59. doi: 10.24159/joec.2017.23.2.37
- Kim, E. G., Ahn, J. Y., Kim, H. J., Kim, J. H., and Yu, W. (2016). Effects of teachers' interest in the 2015 national curriculum on the intention to participate in professional development. *J. Curric. Eval.* 19, 23–47. doi: 10.29221/jce.2016.19.1.23
- Kim, J. C., and Byun, H. J. (2002). A study on the reduction of educational content in the textbooks of the 7th graders' social studies and math. *J. Curric. Eval.* 5, 21–34. doi: 10.29221/jce.2002.5.1.21
- Kim, J. Y. (2019). The comparison of practical arts curriculum documents in general and special elementary school. *J. Learn. Cent. Curric. Instr.* 19, 22–35. doi: 10.22251/jlcci.2019.19.3.23
- Kim, S. Y. (2016). A study on the suggestion strategy of achievement standards for the competency-based curriculum. *Educ. Res.* 66, 1–28. doi: 10.17253/swueri.2016.66..005
- Kim, S., and Kang, H. S. (2009). Analysis of middle school mathematics textbooks and evaluation based on curriculum alignment. *J. Curric. Stud.* 27, 111–139. doi: 10.15708/kscs.27.1.2009.03.006
- Kim, Y. C. (2019). *Survey on Performance level of Students with Intellectual Disabilities in Special School About Achievement Standards of Mathematics of the 2015 Special Education Basic Curriculum*. Master's thesis. Kongju: Kongju National University.
- Korean National Institute of Special Education (2014). *Study on Special Education Curriculum Revision for the 2015 Revised Special Education Curriculum*. Asan: National Institute of Special Education.
- Korean National Institute of Special Education (2015). *Study on the Development of Draft of the National Curriculum Standards of the 2015 Revised Special Education Curriculum*. Asan: National Institute of Special Education.
- Korean National Institute of Special Education (2016). *Study on Ways of the Implementation of the 2015 Revised Special Education Curriculum at Schools*. Asan: National Institute of Special Education.
- Kristiyani, E., and Budiningsih, I. (2019). Pengaruh strategi pembelajaran e-learning dan minat belajar terhadap hasil belajar akuntansi. *Akademika* 8, 81–100. doi: 10.34005/akademika.v8i01.341
- Lee, D. S., and Jeong, H. S. (2010). A review on the international trend and current topic of curriculum for special education: Center of introduction. *Spec. Educ. Res.* 45, 41–60.

- Lee, G. C. (2019). *Analysis of Korean Subject's Semantic Network in the 2015 Revised Basic Curriculum and Common Curriculum*. Master's thesis. Kongju: Kongju National University.
- Lee, G. U., and Jeon, B. U. (2018). Perception of middle and high school special education teachers of achievement standards of the 2015 special educational basic curriculum of physical education. *J. Spec. Educ. Rehab.* 23, 91–117.
- Lee, G. Y., and Jeong, Y. G. (2017). A reflective review on constitution of content system in 2015 revised subject curriculum: focused on key concept, generalized knowledge, and skill. *J. Learn. Cent. Curric. Instr.* 17, 597–622. doi: 10.22251/jlcci.2017.17.16.597
- Lee, H. R., and Lee, G. J. (2019). A narrative inquiry on special education teachers' experience of implementation in integrated subjects. *AJMAHS* 9, 237–245.
- Lee, H. Y., Park, J. H., Lee, D. S., Shin, J. H., and Park, H. S. (2020). A qualitative study on special education teachers' perceptions and experiences regarding the application of the 2015 revised special education curriculum. *J. Educ. Cult.* 26, 269–291.
- Lee, G. G., Jang, W., and Hong, H. G. (2021). Decentralization and recentralization of Korean curriculum documents 2012-2017: A novel approach to text mining in curriculum studies. *Asia Pac. Educ. Rev.* 22, 349–369. doi: 10.1007/s12564-021-09677-x
- Lee, J. S. (2017). The issues and trends in Korean language education. *Korean J. Elem. Educ.* 28, 77–92. doi: 10.20972/kjee.28.2.201706.77
- Lee, J. Y., Jeong, Y. Y., Song, J. A., and Yoo, S. G. (2017). Analysis of the policy process and issues of 2015 revised special education curriculum. *J. Spec. Educ. Curric. Instr.* 10, 141–164. doi: 10.24005/seci.2017.10.2.141
- Lee, P. S. (2019). The study on practical perception of special education teachers in mathematics teaching according to the basic curriculum of special education revised in 2015. *J. Spec. Educ. Curric. Instr.* 12, 49–70. doi: 10.24005/seci.2019.12.4.49
- Lee, P. S. (2020). A study on the perceptions of special teachers on the field applicability of the basic curriculum of special education revised in 2015. *Special Educ. Res.* 13, 25–46.
- Lee, S. L. (2019). *Teachers' Perception, Operation Status, and Support Needs of the Creative Experiential Activities of Hospital Schools with Regard to 2015 Revised Special Education Curriculum*. Master's thesis. Gwangju: Chosun University.
- Lee, S. M. (2013). A study on the improvement of the national curriculum documents for the curriculum autonomy. *Korea Educ. Rev.* 19, 77–97.
- Lee, S. M. (2019). Exploring the directions of the curriculum slimming on the general guidelines of national curriculum: focusing on the needs analysis of teachers and supervisors. *Korea Educ. Rev.* 25, 195–224. doi: 10.29318/KER.25.2.8
- Lim, W. (2014). Beyond one-time, one-sided knowledge transfer: knowledge sharing program with the Dominican Republic. *Anal. Dev. Policy Int. Coop.* 95, 96–160.
- Lockard, C. (2016). *The Effects of Co-teaching on the Reading Achievement of Special Education Students*. Dissertation. Joliet, IL: University of St. Francis.
- Ludovikus, L., and Yulia, Y. (2021). The implementation of the 2013 curriculum in English language teaching. *J. Eng. Lang. Pedagog.* 4, 22–28. doi: 10.36597/jelp.v4i1.10544
- Luo, L. (2018). The impact of teaching reform conflict and job burnout on curriculum implementation in senior high school English teachers. *J. Lang. Teach. Res.* 9, 1101–1108. doi: 10.17507/jltr.0905.26
- Min, K. H. (2017). Research on the meaning of music education in special school and direction of developing the 2015 revised basic music curriculum in special education. *J. Music Educ. Sci.* 33, 39–58. doi: 10.30832/JMES.2017.33.39
- Ministry of Education (2015). *The General Guideline of Revised Special Education Curriculum 2015*. Sejong: Ministry of Education.
- Ministry of Education (2022). *Special Education Statistics 2022*. Sejong: Ministry of Education.
- Moon, H. W. (2017). *Analysis of the Status of Organizing Creative Experiential Activities in Curriculum for Schools for the Visually Impaired*. Master's thesis. Gwangju: Chosun University.
- Oh, C. J., Shin, H. K., and Kim, L. K. (2015). A review of research trends in special education curriculum. *J. Special Educ.* 16, 337–362.
- Oh, S. Y. (2014). A study about the school level curriculum organization plan of students with severe-multiple disabilities according to the basic curriculum. *Korean J. Phys. Mult. Health Disabil.* 57, 107–131. doi: 10.20971/kcpmd.2014.57.3.107
- Oh, S. Y., and Kang, D. Y. (2019). Critical reinterpretation of the concept of competency for special education curriculum site restructuring. *J. Spec. Educ.* 20, 37–62. doi: 10.19049/JSPE.2019.20.4.03
- Park, J. S. (2017). *Qualitative Study on Special Education Basic Curriculum Implementation at Special Education School for Students with Intellectual Disabilities*. Dissertation. Seoul: Sungkyunkwan University.
- Park, M. K., and Kang, G. S. (2017). Implementation and improvement demand of special education teachers for teaching-learning method and evaluation of the students with disabilities in the basic curriculum. *J. Spec. Educ.* 18, 267–296. doi: 10.19049/JSPE.2017.18.2.13
- Park, S. G., Jeong, Y. G., Baek, G. S., Lee, Y. S., Lee, B. H., Kim, C. H., et al. (2014). *Study on the Development of High School Core Achievement Standards Under 2009 Revised Curriculum: National Curriculum Standards*. Seoul: Korea Institute for Curriculum and Evaluation.
- Park, Y. M. (2017). *Study on the Comparison of Physical Education Subjects in the 2011 Revised and 2015 Revised Special Education Basic Curricula*. Master's thesis. Busan: Dong-A University.
- Prasetyono, H., Abdillah, A., Djuhartono, T., Ramdayana, I. P., and Desnaranti, L. (2021). Improvement of teacher's professional competency in strengthening learning methods to maximize curriculum implementation. *Int. J. Eval. Res. Educ.* 10, 720–727. doi: 10.11591/ijere.v10i2.21010
- Qomari, R. (2016). The evaluation of curriculum implementation on Islamic higher education in Indonesia. *Ijtimaiyya J. Muslim Soc. Res.* 1, 97–112. doi: 10.24090/ijtimaiyya.v1i1.929
- Ra, S., Kim, S., and Rhee, K. J. (2019). *Developing National Student Assessment Systems for Quality Education: Lessons from the Republic of Korea*. Mandaluyong: Asian Development Bank. doi: 10.22617/TCS190597-2
- Ruth, C., and Ramadas, V. (2019). The “Africanized” competency-based curriculum: the twenty-first century strides. *Shanlax Int. J. Educ.* 7, 46–51. doi: 10.34293/education.v7i4.640
- Saad, K. A. (2019). *Peer Coaching in Malaysia: Exploring the Implementation of a Professional Learning Communities' Program for Arabic Language Secondary School Teachers*. Liverpool: Liverpool John Moores University.
- Sarafadeen, R. O. (2021). Implementation of junior secondary schools' curriculum in Nigeria problems and way forward. *Int. J. Devel. Public Policy* 1, 307–315.
- Shin, S. Y., Park, C. U., and Lee, H. R. (2018). Analysis of special teacher's interest in 2015 special education basic curriculum. *J. Special Educ.: Theory Pract.* 19, 189–209. doi: 10.19049/JSPE.2018.19.3.08
- Shin, Y. S., Yoon, S. W., and Cho, D. H. (2017). The development and implementation of elementary 5th-6th grade learning activities according to analysis on achievement standards of 2015 revised special education basic curriculum. *Music Crit.* 9, 59–76.
- Shuhaibah, S., Syarif, S., and Khuluqo, I. E. (2022). Evaluation of learning curriculum implementation during the COVID-19 pandemic. *JKP* 4, 608–619. doi: 10.22236/jkpuhamka.v4i2.8210
- Snyder, J., Bolin, F., and Zumwalt, K. (1992). “Snyder, jon, frances bolin, and karen zumwalt, curriculum implementation,” in *Handbook of research on curriculum*, ed. P. W. Jackson (New York, NY: Macmillan), 402–435.
- So, K. H. (2000). A study on the conflict between general and subject curriculum in the revision practice of Korean national curriculum. *J. Curric. Stud.* 18, 201–218.
- Son, J. M. (2018). *Comparison of Fine art Subject of Middle and High Schools in the 2011 and 2015 Special Education Basic Curricula*. Master's thesis. Kongju: Kongju National University.
- Son, M., and Jeong, D. (2019). Limits of STEAM education and its improvement alternative: Based on the viewpoints of STEAM expert teachers. *J. Korean Assoc. Sci. Educ.* 39, 573–584.
- Song, E. S., and Choi, J. H. (2019a). An analysis of special education teachers' stages of concern on the 2015 revised special education curriculum. *J. Educ. Innov. Res.* 29, 297–321.
- Song, E. S., and Choi, J. H. (2019b). The analysis of special education teachers' stages of concern and levels of use on the 2015 basic curriculum of special education: focusing on the concerns-based adoption model (CBAM). *J. Spec. Child. Educ.* 21, 241–271.
- Song, S. M. (2019). Comparative analysis of the core competencies and achievement standards of the practical arts and career and vocational subjects in the 2015 revised special education basic curriculum. *J. Spec. Educ. Curric. Instr.* 12, 1–25. doi: 10.24005/seci.2019.12.4.1
- Song, Y. S., Lee, J. S., and Jeon, B. U. (2020). Perception of middle and high school special education teachers of achievement standards of the 2015 special

educational basic curriculum of science education for students with intellectual disability. *J. Spec. Educ.* 36, 139–167. doi: 10.31863/JSE.2020.08.36.2.139

Won, C. L. (2018). A study on the change of basic music curriculum for elementary school in special education. *Korean J. Res. Music Educ.* 47, 57–79. doi: 10.30775/KMES.47.2.03

Wrastari, A. T. (2020). Learning and poverty: the exploration of teachers' learning capacity in a school with poverty in Indonesia. *Int. Forum Teach. Stud.* 16, 3–25.

Yang, M. H. (2018). *Study on the Model for School-Level Competence-Based Special Education Curriculum Development*. Dissertation. Changwon: Changwon National University.

Yoo, H. M., and Choi, S. B. (2019). Analysis of hierarchy of information subjects of 2015 revised basic curriculum and common curriculum. *J. Spec. Educ. Rehab.* 23, 1–24.

Zhang, H., and Zhang, W. (2012). "Some factors affecting nursing curriculum implementation," in *Information Engineering and Applications*, eds R. Zhu and Y. Ma (London: Springer), 1026–1031. doi: 10.1007/978-1-4471-2386-6_134

Zucker, T. A., Jacobos, E., and Cabell, S. Q. (2021). Exploring barriers to early childhood teachers' implementation of a supplemental academic language curriculum. *Early Educ. Dev.* 32, 1194–1219. doi: 10.1080/10409289.2020.1839288