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KOREAN ELEMENTARY TEACHERS' PERCEPTIONS OF GIFTEDNESS AND SUPPORT FOR TALENT DEVELOPMENT

A Dissertation

Presented to

The Faculty of The School of Education

The College of William and Mary in Virginia

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

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by

YoungEun Son

December, 2014

KOREAN ELEMENTARY TEACHERS' PERCEPTIONS OF GIFTEDNESS AND SUPPORT FOR TALENT DEVELOPMENT

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Most of all, I am thankful for God who gave me invisible power and wisdom whenever I felt frustrated and I wanted to give up. This project is the culmination of the learning that I never dreamed that I could accomplish. Really, my beginning was small and humble. I started from the perception that although students like my son are identified as gifted, there are few opportunities for them to receive gifted education in Korean schools. However, my hope that I want to help gifted students was gradually realized through the graduate program at the College of William and Mary. In this program, I really learned many visible things, such as teaching methods and strategies, and invisible things, such as cultural experiences. In fact, I had many disadvantages compared with native students. I did not have good English abilities, rich experiences in the field of gifted education, or an American educational background. However, I had passion to learn and faculty who happily helped me and understood my challenges. Without their support, encouragement, and patience, I would not have completed this program and dissertation. In particular, I want to express my special thanks to my committee members of Dr. Tracy Cross, Dr. Jennifer Cross, and Dr. Pamela Eddy.

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ABSTRACT

The Korean government has made attempt to provide eligible gifted students with more opportunities and to improve gifted education by announcing plans for gifted education. Particularly, the third plan tries to introduce teachers' observations and recommendations as identification methods to select more diverse gifted students. To succeed with these methods, it is very important for teachers to have correct perceptions about gifted education. This study investigated Korean elementary teachers' perceptions about giftedness and support for talent development.

The survey was constructed based on the Talent-Development Mega-Model (Subotnik, Olszewski-Kubilius, & Worrell, 2011). Also, two constructs of TCGiftedness ad TDS were created to answer two research questions: (a) *What are the perceptions of Korean elementary teachers about giftedness in terms of talent development?* and (b) *What perceptions do Korean elementary teachers have regarding teaching gifted students related to talent development?* The following results were obtained from the analysis of a total of 834 valid surveys. In two constructs, a full sample leaned more toward the contemporary TCGiftedenss. Also, they supported the accommodation of teaching strategies for gifted students' talent development. However, the degree was not very high. Additionally, participants showed that common perceptions in individual survey items in terms of ranking order and thematic categories. Also, they indicated statistically significant differences in their perceptions among demographic groups in two constructs. Together, these

findings suggest that it is necessary for the government to improve teachers' misguided perceptions about giftedness and to encourage them to accommodate beneficial teaching practices for gifted students' talent development.

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CHAPTER 1

INTRODUCTION

In 1993, Ross described the situation of the unrecognized abilities of many American gifted and talented students and their unmet needs as a "quiet crisis" (p. 1). What does it mean to be gifted? The National Association of Gifted Children (NAGC) defines giftedness as follows:

> Gifted individuals are those who demonstrate outstanding levels of aptitude (defined as an exceptional ability to reason and learn) or competence (documented performance or achievement in top 10% or rarer) in one or more domains. Domains include any structured area of activity with its own symbol system (e.g., mathematics, music, language) and/or set of sensorimotor skills (e.g., painting, dance, sports) (NAGC, 2008)

When compared with this definition of gifted education used in the U.S., Korean gifted and talented students face an even more difficult educational environment. Only 1.76% of the entire student population participated in gifted programs in 2012. When compared with Renzulli and Reis's (1997) suggestion, this percentage of students is very low. In the Schoolwide Enrichment Model (SEM), they have maintained that the scope of the identification of gifted students should expand to 15%-20% of the school population.

Adding to the crisis in Korea is the issue of inequality in opportunities due to self-supported out-of-school programs (Olszewski-Kubilius, 1998). In Korea, private educational supplementation, such as tutoring thrives. Lee (2014) reported that 80.9% of Korean elementary students receive private education outside of school. However, this type of support becomes a critical social problem, because it can undermine the equality of educational opportunities due to the fact that the finances of families determine their access to resources (Farrell, 2013). For example, the majority of Korean gifted programs (83%) focus on the domains of mathematics and science while programs for the gifted in other areas, such as music and athletics, only comprise 17% (Korean Ministry of Education, 2013). Thus, almost all talent development in nonacademic domains is accomplished through private education. In the case of gifted students from families with low socio-economic status (SES), there are few opportunities to develop their potential due to the cost. Therefore, for all students to have opportunities, it is important for the Korean government to provide more gifted programs to schools to nurture diverse talents.

In addition to expanding gifted programs, it is critical for Korean teachers to have accurate perceptions and knowledge of giftedness. Most states in the U.S. require teacher referral along with checklists or rating scales to select or place students in gifted programs (Davidson Institute, 2006). However, in Korea, teachers' recommendations and their observations have tended to be disregarded in determining whether students are eligible to participate in gifted programs. Therefore, there has been criticism that although gifted students from families with low SES have potential, there are few opportunities for them to recognize their talent or potential (No, 2013). In response to this criticism, teachers' observations and recommendations are being gradually emphasized in the identification of students' hidden talents or potential in the New Comprehensive Plan for Gifted Education (Korean Ministry of Education, 2013).

Nonetheless, teachers do not always have accurate perceptions and understanding of giftedness and teaching gifted students (Davidson Institute, 2006; Jun, Kim, Lee, & Park, 2013). Research has shown that because some teachers have negative stereotypes and incorrect understanding about the abilities of culturally and linguistically diverse (CLD) students, the teachers' referral rate for these groups is relatively low (Davidson Institute, 2006; Huff, Houskamp, Watkins, Stanton, & Tavegia, 2005; Rist, 1996). In the U.S., both White and Black teachers, even preservice teachers, perceive White students more positively than minority students, including English Language Learners (ELL), among non-gifted students as well as gifted students (Cho & DeCastro-Ambrosetti, 2005/06; Elaine & Lora, 2009; Tettegah, 1996). As a result, these students are underrepresented in gifted programs (Huff, Houskamp et al., 2005; Rist, 1996). Furthermore, teachers with low expectations of CLD students may tend to assign these students to special classes, thinking that they suffer from initial learning problems rather than that they are experiencing language difficulties (McCombs & Gay, 2001).

Jung, Kim, Lee, and Park (2013) reported that Korean teachers tend to regard students as gifted if they have high test scores, good attitudes, and fluent communication skills. Homeroom teachers tend to emphasize parents' educational attainment or SES rather than students' giftedness (Jung et al., 2013). Additionally, No (2013), a gifted teacher in a Korean high school, poses a concern about the effectiveness of using teachers' recommendations and observations for identification in Korean schools due to the following reasons. First, it is not easy for teachers to closely observe many students simultaneously to identify their giftedness. Second, Korean gifted programs focus particularly on academic domains such as math and science. Teachers pay more attention to academic giftedness, rather than looking for giftedness in diverse domains. If more gifted students with potential are to be included in gifted programs by utilizing teachers' recommendations and observations, both of these issues should be considered. Only then can the authentic purpose of the government's plan, which is intended to provide eligible gifted students with more opportunities, be accomplished.

The purpose of the present study is to investigate what perceptions Korean elementary teachers have about giftedness and teaching gifted students related to students' talent development. There is an important reason why elementary teachers were selected as participants. In Korean society, getting into the most prestigious universities is more important than pursuing a specific talent or interest (Choe, 2008). Therefore, most gifted programs are implemented in the elementary schools rather than in secondary schools. Most secondary schools focus on entering the university whereas elementary schools focus more on exposing students to more diverse activities. The concept of giftedness is directly connected with elementary teachers' actual practices. Consequently, elementary school teachers are likely to provide trustworthy empirical data and will constitute the sample for this study.

Conceptual Framework

The conceptual framework of this study was grounded in the Talent-Development Mega-Model (TDMM) developed by Subtnik, Olszewski-Kubilius and Worrell (2011). The following principles undergird this model:

- Abilities, both general and domain-specific, are critical in talent development and can be developed.
- Each domain of talent has a distinct developmental trajectory

- Psychosocial variables are determining factors in accomplishing successful talent development
- Eminence is the expected outcome of gifted education.

In addition, this model emphasizes the determining factors such as creativity, motivation and opportunity affecting the growth of talent. It also takes into account that the trajectories of talent development are affected by training and education.

In this study, the following two main concepts were investigated: Korean elementary teachers' perceptions toward giftedness, and their perceptions about teaching gifted students. The concept of giftedness in this model differs from the traditional definition of giftedness. In the traditional concept, giftedness has been regarded as an innate quality of individuals that can be identified by such cognitive assessments as IQ testing (Robinson, Zigler, & Gallagher, 2000). On the contrary, the model I chose assumes that special aptitudes found in each domain as well as general reasoning abilities are critical to the development of gifted students' talents. Hence, the selected model strongly considers the acuity or propensity toward the specific domain as a sign of potential talent or aptitude.

This model also underscores that in developing giftedness, each domain shows a distinct performance trajectory across the life span regarding when the skills and abilities emerge and when such skills and abilities are merged with in each talent domain. The beginning, peak, and ending points of developmental trajectories in each domain vary widely. For example, the development of talent in gymnastics should begin during early childhood. Gymnastic abilities will peak and gradually end during late adolescence. On the other hand, the development of vocal talent begins during late adolescence and ends during late adulthood (Subotnik et al., 2011). This study will investigate Korean teachers' view about giftedness and developing giftedness in each domain.

Regarding teaching gifted students for the development of talent, the TDMM (Subotnik et al., 2011) starts with the assumption that abilities can be developed. It accepts that ability is a malleable construct. This model also suggests that gifted students experience several transitions during the talent developmental process in academic and nonacademic domains. To successfully accomplish transitions through each stage of the development process, various strategies and programs for gifted students should be implemented (Bloom, 1985). These differentiated strategies or programs are accommodations teachers make for gifted learners. Multiple factors during this process can promote or hinder the talent development. Therefore, these factors should be considered in instructing gifted students.

This study investigated the perceptions that Korean elementary educators have regarding how to teach gifted students to develop their talents in academic and nonacademic domains. The TDMM (Subotnik et al., 2011) offers insights about domain-specific giftedness and how to teach gifted students to develop their talents across the life span. In summary, this model functioned as a theoretical framework in investigating Korean teachers' perceptions about giftedness and teaching gifted students in terms of talent development.

Significance of Research Topic

On January 13, 2014, a Korean Newspaper reported that Arne Duncan, U.S. Secretary of Education, complimented South Korea as a country that the U.S. wants to emulate in terms of the educational policies and passion for education (Lee, 2014). South Korea is one of the countries where students show the highest achievement in academic domains such as mathematics and reading. For example, the Korean Ministry of Education (2013) reported that students at the age of 15 had the highest level of educational achievement, with first place in mathematics, first or second place in reading, and second to fourth in science among 34 Organization for Economic Co-operation and Development (OECD) countries as measured by the Programme for International Student Assessment (PISA). Surprisingly, however, when investigating emotional achievement indicators related to learning, Korean students had almost the lowest rank. For example, in assessing internal motivation, interest in and enjoyment of math, Korean students placed 58th among 65 investigated countries (Veritas α Educational Newspaper, 2013).

When analyzing these results, one cannot disregard Koreans' excessively ingrained perception that educational success is achieved when students, including gifted students, get into the most prestigious universities regardless of their talents or interests (Choe, 2008). Therefore, almost every student focuses on their intellectual domain, without considering their aptitudes, making every effort to raise their test scores in order to gain admission to the more prestigious universities (Choe, 2008). Due to little consideration of students' aptitudes based on this value system, this lack of internal motivation and interest for learning explicitly appears in the gifted student population. For example, Lee (2008) reported through a Korean television program, *News Pursuit*, that many Korean gifted learners do not demonstrate their potential in diverse domains because their learning needs and talents were not met in the schools, and some gifted students even dropped out of school. In particular, the fact that 82% of gifted programs in schools focus on math and science regardless of educational levels, hardly offering gifted programs for talents in other areas, exacerbates this situation (Korean Ministry of Education, 2013). Thus, it is critical to consider how the Korean school system can serve more gifted students, particularly those showing talents in more diverse domains, such as music, art, and athletics.

As one of the most important aspects of putting this goal into practice, it is necessary that teachers have an accurate perception and knowledge of the characteristics of gifted students and their educational needs. However, as mentioned previously, teachers can have inaccurate and biased perceptions of giftedness. In identifying giftedness, they consider factors such as the SES of parents, positive attitudes, students' ethnicity and excellent communication skills rather than students' talents (Elaine & Lora, 2009; Jung et al., 2013; McCombs & Gay, 2001). Under these teachers' perceptions, potential gifted students such as creative students with relatively low test scores or poor CLD students with talent in art who do not fit the stereotype of gifted students tend to be disregarded (Davis & Rimm, 2004).

The Korean Ministry of Education (2013) announced that it would provide more students with opportunities to take part in gifted programs. Along with this goal, the Third Comprehensive Plan for Improvement of Gifted Education (Korean Ministry of Education, 2013) recommends that the proportion of institutions where they use teachers' referral as an identification criterion should expand from 48.4% (2012) to 70.0% (2017). Thus, teachers' accurate perceptions of giftedness and teaching gifted students are critical. Although this research topic is critical, there is very little literature related to the topic investigating teachers' perceptions about giftedness and teaching gifted students in terms of talent development. This gap in the research enhances the value of this investigation as an exploratory study. In summary, this research is significant because: (a) it can contribute to understanding what kind of perceptions Korean teachers have regarding giftedness and teaching gifted students related to talent development; (b) if the perceptions that teachers have are biased, administrators or professionals can implement professional development to change their biased views; and (c) it will serve as an initial study in the field where little research exists, and the questionnaire constructed to investigate teachers' perceptions related to talent development will be an effective measurement tool that can be applied to replication studies. Based on the findings of this study, administrators or policy makers can identify whether teachers have accurate knowledge and perceptions of giftedness and instructing gifted students related to talent development. This is a critical prerequisite for teachers' referral to succeed as an identification method.

Research Questions

To investigate this problem, the following research questions guided this study: (1) *What are the perceptions of Korean elementary teachers about giftedness in terms of talent development?* and *(2) What perceptions do Korean elementary teachers have regarding teaching gifted students related to talent development?* In particular, this study focused on the perceptions of Korean teachers related to gifted students' talent development, using the TDMM (Subotnik et al., 2011) as a conceptual framework. The study investigated how Korean teachers perceive both giftedness and the teaching of gifted students in developing their talents in diverse areas. This study is different from most Korean and American literature in this field in the following way. Previous studies have investigated the perceptions of general teachers or gifted teachers toward giftedness and/or how they can efficiently teach gifted students. However, this study places more emphasis on the issue of teachers' perceptions about talent development.

Assumptions and Limitations

This study was conducted based on the following assumptions:

- The theoretical framework of this study is placed in the context of American gifted education (e.g., curriculum, educational philosophy, and pedagogies), which is different from that of Korean gifted education. For example, in American gifted education, pull-out programs are a gifted service option that is actively implemented in public schools. On the contrary, although Korean gifted education considers the pull-out programs, Korean public schools do not implement the programs due to multiple reasons (i.e., Korean public schools' educational philosophy emphasizing the equality of educational opportunity).
- Teachers' perceptions affect their behaviors and attitudes. For example, as explained in the previous section, because teachers with low expectations of CLD students think that the CLD learners suffer from initial learning problems rather than experiencing language difficulties, the teachers may tend to assign these students to special classes.
- The talent development approach to educating gifted students is an important approach in gifted education. As a representative trend, the talent development approach appeared as an alternative to the gifted child approach from the 1980s to 1990s. The idea that it is necessary to break the orthodoxy of giftedness defined by general intelligence to broaden the notion of giftedness accelerated the appearance of talent development approach (Renzulli, 1986; Sternberg, 1985; Witty, 1958).

Also, this study has the following limitations: First of all, this research was conducted among teachers in public elementary schools in Seoul, a large city. The perceptions of teachers in other regions such as rural areas and small cities might be different, because other regions have different conditions in terms of budget, infrastructure, and the quality of personnel. The second limitation is the differences in practices due to the varying educational context. The conceptual framework of this study is based on American gifted education. In other words, the TDMM (2001) is built on practices that are implemented or considered in American schools. The researcher constructed survey questions based on the theoretical model. However, some of these gifted education practices or programs are not implemented in the Korean school system. For example, pull-out programs have never been implemented in Korean schools. Thus, if a definition of pull-out programs was included in the questionnaire and teachers were asked for their perceptions of pull-out programs, they might understand the meaning and respond to the questions. However, it is also possible that teachers would have different perceptions from those of teachers in schools where such programs are implemented.

As the final limitation, there is the issue of translation. Although the survey is constructed in English, it should be translated because participants are Korean. The Measurement and Methods Core of the Center for Aging in Diverse Communities (MMCCADC, 2007) explains that a well-translated survey instrument should possess semantic equivalence across languages, conceptual equivalence across cultures, and normative equivalence across societal norms as compared with the source survey. However, literature maintains that it is much harder to accomplish these three types of equivalence when translating a survey that asks questions about attitudes and opinions.

This is because the ideas are more abstract and the concepts may not be familiar to the society. In this study, the survey investigated teachers' perceptions. Thus, this translated survey has the limitation that it was more difficult to achieve these three types of equivalence.

Definition of Terms

This study uses the following diverse definition of terms.

- *Bloom's Taxonomy*: Developed in 1956 by Benjamin Bloom, the taxonomy is often used to develop curriculum for gifted children. There are six levels within the taxonomy that move from basic to high levels of thinking. The original levels included knowledge, comprehension, application, analysis, synthesis, and evaluation. The taxonomy was later updated to reflect 21st-century skills, with the levels changing to remembering, understanding, applying, analyzing, evaluating, and creating (NAGC, 2008).
- *Creativity*: The process of developing new, uncommon, or unique ides The federal definitions of giftedness identifies creativity as a specific component of giftedness (NAGC, 2008).
- *Eminence*: Society's highest standard…high-level achievement and societal recognition, usually marked by a contribution that has historical significance in a given field or across several fields (VanTassel-Baska, 1989)
- *Talent Development*: Programs, curricula, and services for gifted and talented students that can best meet their needs, promote their achievements in life, and contribute to the enhancement of our society

when schools identify students' specific talent strengths and focus educational services on these talents (NAGC, 2008)

Summary

When the Korean educational system faced the lack of opportunity due to the prosperity of private education and gifted programs focused on math/science, the Korean government intended to identify more gifted students in diverse areas. Therefore, teachers' recommendations and observations were emphasized in the Third Comprehensive Plan for Improvement of Gifted Education (Korean Ministry of Education, 2013). However, it is not easy to achieve such a goal without improving teachers' perception related to giftedness and teaching gifted students; teachers' perceptions can directly affect the identification of gifted students (Davidson Institute, 2006; Huff et al., 2005; Rist, 1996). Thus, this investigation is very meaningful because incorrect or insufficient perceptions held by teachers can be changed and improved based on this study's results. In particular, elementary teachers' perceptions are more trustworthy because elementary teachers have more opportunities than secondary teachers to observe, recommend or select gifted students.

In this study, the TDMM (2011) plays an important role as a theoretical framework in investigating answers of the two research questions presented in this study; it can offer insights about domain-specific giftedness and how to teach gifted students to develop their talents across the life span. Because Korean education does not specifically consider interest, aptitude or talent of gifted and non-gifted students, this study may be helpful in turning teachers' thinking and attention to students' talent development, despite a few limitations (e.g., the differences between the context in which research was conducted and on which the theoretical framework is grounded, and the concerns in translating the survey). Also, this study can provide teachers, administrators and policy planners in gifted education with valuable insight about teachers' perceptions with regards to giftedness and teaching gifted students in terms of talent development.

CHAPTER 2

LITERATURE REVIEW

For nearly a century, scholars and researchers have sought to identify, understand and measure giftedness (Cross & Coleman, 2005; Dai & Chen, 2013; Gross, 1999; Renzulli, 1986; Sternberg, 2000). Regarding who should be considered "gifted," "talented," or both, no consensus exists among professionals (Neihart, Reis, Robinson, & Moon, 2002). The Marland definition (1972) appeared as the first U.S. federal definition of the gifted and talented. Its definition of giftedness includes high ability in leadership ability, visual and performing arts, creative or productive thinking, and psychomotor skills, along with academic and intellectual talent. Although defining giftedness is a complicated matter. The definition will affect several aspects related to educating gifted students. First, the definition adopted by a school district will guide the identification process in selecting students for gifted services. Second, there is a danger that the definition and the subsequent identification methods may negatively affect some groups such as minorities or students from low SES families. Third, the definition can influence available programming for different types of gifted and talented students. Finally, labels such as "gifted" can affect gifted students in terms of socioemotional development (Davis & Rimm, 2004). In the gifted education field, some contrasting approaches exist regarding how giftedness is conceptualized and how gifted students are educated. Among them, the traditional gifted child approach and the talent development approach are the most representative approaches in the field (Dai & Chen, 2013).

The gifted child approach had its beginnings in the first systematic study to explain the construct of giftedness – Lewis Terman's study in 1921. His seminal study, *Genetic Studies of Genius* (Terman, 1925), offered invaluable insights related to gifted students' cognitive abilities. The introduction of intelligence testing by Terman (1925) could be regarded as a technical breakthrough, because the use of objective testing made it possible to claim that the identification of gifted students is theoretically sound and practically viable.

However, the use of IQ testing to select gifted students caused some concerns. Because identifying gifted students by exclusively using IQ testing does not reflect diverse types of human intelligence, the practice misses a broad range of individuals with talents in diverse domains (Witty, 1958). For example, Sternberg and Grigorenko (2002) suggest that, because it is very easy to select gifted students by using IQ tests or similar measurement tests, administrators may be tempted to use these tests exclusively. However, they add that, although IQ tests give an appearance of objectivity, fairness, reliability, and validity, this appearance is deceptive (Gardner, 1983; Sternberg, 1997). Although these IQ tests can provide information about children's analytical abilities, they provide little information about other abilities such as creative or practical ones (Sternberg, 1999).

Renzulli (1986) suggests there is a gap between school-house giftedness, which is manifested by high test scores, and creative-productive giftedness, which is manifested by high-level performance and creative ideas. He maintains that, although school-house gifted individuals are likely to show excellent abilities in academic environments, they may not demonstrate their gifts outside school environments. On the contrary, individuals with creative-productive giftedness will be more likely to make more enduring contributions, showing their outstanding gifts outside such academic environment (Renzulli, 1986). Thus, there have been concerns about the appropriateness of traditional gifted programs because these programs select individuals with school-house giftedness through IQ tests and achievement tests.

Increasingly over recent decades, the suggestion has been made that it is necessary to break the orthodoxy of giftedness defined by general intelligence and to broaden the conception of giftedness to include a wider range of human endeavors and activities (Renzulli, 1986; Sternberg, 1985; Witty, 1958). As the conceptions of multiple or multidimensional intelligences began to appear in the 1980s (Gardner, 1983; Sternberg, 1985), researchers in gifted education became interested in the manifestation of talents in diverse domains and how these talents develop (Bloom, 1985; Gagné, 1985; Piirto, 2000). Based on this background, the talent development approach appeared as an alternative to the gifted child approach from the 1980s to 1990s, in response to the narrow identification of gifted students through IQ-based definitions (Robinson, 2012). This approach emphasizes diverse manifestations of gifted behaviors and performances, instead of the notion of a gifted child category (Dai & Chen, 2013). In particular, Renzulli's (1986) three-ring concept of giftedness composed of above-average ability rather than high IQ, task commitment, and creativity importantly affected the expansion of the definition of giftedness. In the following sections, the gifted child approach and talent development approach will be investigated in more detail.

The Gifted Child Approach

The primary way to identify giftedness throughout most of the 20th century in the U.S. was to define giftedness through intellectual ability. From this perspective, called the gifted child approach, giftedness is regarded as an innate quality of individuals that can be identified by cognitive assessments such as IQ testing

(Robinson, Zigler, & Gallagher, 2000). In other words, this method stratifies children based on IQ, which is looked upon as the main indicator of the mental-ability factor through the general intelligence (*g*) reflected on all tests measuring intelligence and ability (Borland, 2003; Shepard, 2000). This approach also assumes that, because gifted students have reasoning abilities that make it possible for them to succeed across all academic domains, they remain gifted throughout their lifetime regardless of their achievement. This belief is strongly ingrained in the minds and perceptions of educational professionals and the public as well as in policies and practices of states and local school districts across the United States (Council of State Directors of Programs for the Gifted and the National Association for Gifted Children, CSDPG/NAGC, 2009).

Purpose

The goals for gifted education within the gifted child approach are different according to the Terman (1925) tradition and the Hollingworth (1942) tradition. The goal of the Terman tradition is to use gifted students' potential most productively (Dai & Chen, 2013). In other words, through gifted education programs, gifted students become future leaders in their respective domain, contributing to the welfare of a society. On the contrary, the Hollingworth tradition focuses on the assumption that gifted children and adults are qualitatively different from the rest of the population, emphasizing that highly intelligent children are more socioemotionally vulnerable (Hollingworth, 1942). Thus, Hollingworth maintains that the intervention and programs employed in gifted education should cater to the unique characteristics of gifted students' cognitive and socioemotional development (Dai & Chen, 2013).

The Target Students

The gifted child approach has predominantly used various IQ tests or other psychometric tests as the main criteria to establish the gifted student category. As a result, by using the strict cut-off scores according to the Terman tradition, a small portion of 3%-5% of students will be identified as gifted students and will be eligible for gifted services in the school. Further, IQ scores can differentiate the levels of giftedness. For example, Gagné (2005, 2007) proposed a five-step system of intensity levels based on the metric system called the merit-based (MB) system. According to the system, there are successively more selective subgroups such as moderately (top 1 %), highly (top 1:1,000), exceptionally (top 1:10,000), and extremely (top 1:100,000) gifted. This approach can stipulate a typology and profiling of diverse subgroups such as the creatively gifted (Gagné, 2005; Torrance, 1963), extremely gifted students or gifted underachievers (McCoach & Siegle, 2003).

Strategies: How to Teach Gifted Students

The gifted child approach suggests that gifted students should be provided services that can meet a distinct set of educational goals for gifted students. In other words, the approach maintains that those identified as gifted should be offered various learning activities to develop gifted students' potential and to enhance creativity, leadership, or higher-order thinking skills (Dai & Chen, 2013). This approach uses the following two major practices: acceleration and enrichment. Acceleration such as subject-based and grade-based can offer programs to reflect the faster learning pace of gifted students. Enrichment activities can provide the gifted with opportunities to learn among intellectual peers in a challenging environment (Rogers, 2007). In addition, this approach emphasizes affective curricula and counseling programs to help gifted students' socioemotional development (VanTassel-Baska, Cross, & Olenchak, 2009). These curricula and programs take into account gifted students' asynchronous development (Silverman, 2002), discrepancies between their intellectual abilities (mental age) and their physical abilities (chronological age). The traditional gifted child approach accepts the emphasis on these affective curricula and programs as one of the distinct components of gifted education (Silverman, 1993; VanTassel-Baska et al., 2009). The following section will examine these two practices in more detail.

Enrichment. Enrichment is defined as a set of programming options that extend and complement the regular curriculum (Adams & Pierce, 2008; Coleman & Cross, 2005; Reis & Renzulli, 2010). In particular, enrichment learning activities include diverse topics such as guest speakers or cartooning that are not typically dealt with in the regular curriculum. Regarding enrichment, many people criticize, asking "Wouldn't these programs be beneficial for all students, not just for gifted students?" However, Davis and Rimm (2004) suggest that, although there are enrichment activities that are beneficial for all students (e.g., thinking skills training, college and career information, and field trips), there are also enrichment experiences that only bright gifted students can manage such as independent projects or summer College for Kids (Davis & Rimm, 2004).

Enrichment is different from acceleration in that enrichment learning activities are not instructed at more sophisticated educational levels, whereas acceleration learning activities could be applied in high school or college sophistication levels (Subotnik et al., 2011). The overall goal of providing enrichment programs is to allow gifted students to be involved in more diverse topics at greater depth. Davis and

Rimm (2004) present a few objectives of enrichment activities, such as content and resources beyond the regular curriculum, high content complexity, and the development of thinking skills such as creative and critical thinking skills.

In particular, it is very important to offer gifted students opportunities to learn and to socialize with like-ability peers through grouping strategies while participating in enrichment activities (Rogers, 2007). For example, research indicates that the effectiveness of ability grouping (e.g., within-class grouping and cluster grouping) is substantially positive. For example, the effects reported by research range from one third of a year's additional growth for full-time secondary gifted classes (upper at the elementary level) to three-fifths of an additional year's growth for cluster grouping (Gentry, 1999; Kulik & Kulik, 1984, 1992; Rogers, 2007). Also, like-ability cooperative learning has a moderately positive effect on academic achievement (Hollingsworth & Harrison, 1995; Neber, Finsterwald, & Urban, 2001). Although enrichment is the most frequently employed programming in regular school settings, there are few formal research results to evaluate its effectiveness (Olszewski-Kubilius & Lee, 2004). Thus, it is unclear why enrichment programs should be implemented for gifted students (Subotnik, et al., 2011). More research related to the effectiveness of enrichment activities for gifted students should be conducted.

Acceleration. Scholars suggest that acceleration is a uniquely appropriate instructional strategy for gifted students based on two assumptions. First, intellectually gifted students can learn and obtain information more rapidly than their peers. Second, it is necessary for gifted students to be placed above grade-level due to their rapid and deep knowledge acquisition (Argys, Rees, & Brewer, 1996; Colangelo, Assouline, & Gross, 2004; Subotnik et al., 2011). Precocious gifted students in the

Study for Mathematically Precocious Youth (SMPY) succeeded in fast-paced classes that were provided early, at or above the rates documented for their older students (Brody & Stanley, 1991; Swiatek & Benbow, 1991). They also tended to retain information more accurately even in accelerated classes. That is, students participating in SMPY or its replications (e.g., Northwestern or Duke University) completed 2 years of advanced mathematics in one year's time, in contact with the teacher for approximately 2-3 hours per week during the year. In addition, Rogers (2007) maintained that similar finding have been reported for Saturday and summer courses in areas such as foreign language, history and science, wherein gifted students successfully completed a full year of course work in a small number of hours or weeks with content presented much faster than in their regular classrooms.

In addition, as argued strongly in *A Nation Deceived: How Schools Hold Back America's Brightest Students* (Colangelo, Assouline, & Gross, 2004), many subject-based acceleration methods demonstrate positive academic achievement in the specific subject areas (Rogers, 2007). For example, Rogers (2004, 2007) found that the effects of subject-based acceleration options range from roughly one third of a year's additional growth (Advanced Placement or International Baccalaureate) to three fifths of a year's academic growth (mentorship and subject acceleration). In particular, science or mathematics subject acceleration studies showed dramatic achievement growth for gifted elementary and secondary students (Ivey, 1965; Lynch, 1992; Stanley, 1976). Grade-based academic acceleration such as grade skipping, grade telescoping or early admission to college show substantial academic effects, ranging from one-third of a year's growth for early admission to university (Swiatek & Benbow, 1991) to a full year's additional growth for grade skipping (Rogers, 2004;

Splaine, 1981). Consequently, evidence related to the effectiveness of acceleration on intellectual growth demonstrates very positive outcomes.

On the contrary, strong concerns exist about socioemotional growth using this acceleration method. While a few negative effects have been found among individuals, few studies reported negative socioemotional consequences in the acceleration of groups of students (Freeman, 2010; Neihart, 2007). Although there are many concerns about grade-based acceleration, research demonstrates that its social impact is very positive and its emotional impacts are small and positive (Rogers, 2007). In particular, Gross (2006), who studied the acceleration of exceptionally gifted students with IQs greater than 160, found that students who were not accelerated suffered from mere adjustment difficulties in comparison to their accelerated peers.

The Talent Development Approach

The gifted child approach regards giftedness as an innate quality in individuals that can be identified by cognitive assessments, such as IQ testing (Robinson, Zigler, & Gallagher, 2000). As Terman's legacy suggests, giftedness is equated with high IQ. This gifted child approach only identifies a small portion (3%-5%) of a given school's student population as gifted by using strict cut-off scores. Thus, because few students enjoy the benefits from gifted services in the school, gifted education has been criticized as elitist.

The talent development approach maintains that more diverse groups of gifted students should be identified to receive gifted services. This approach suggests that the criteria of identification should shift from mental superiority based on the strict cut-off score to authentic performance in diverse domains to demonstrate gifted learners' aptitude. Also, this approach contends that criteria to select gifted students should not exclusively focus on psychometric methods such as IQ tests. Rather, it should employ multiple criteria such as performance-based assessment, product assessment, and portfolios assessing authentic performance in academic and nonacademic domains, as well as psychometric tests (VanTassel-Baska, 2008). Also, the identification methods used to select target students should be broadened to include more potential students. For example, Renzulli and his colleagues (Renzulli & Reis, 1994) proposed a talent pool identification approach with the intent of casting a wide net.

Compared with traditional identification, the talent pool identification approach is multidimensional and flexible. The following are examples of various nomination routes: (a) alternative pathways such as self-nomination, parent and peer nomination, creativity test results and product evaluation; (b) special nomination by previous-year teachers to avoid the biases of current teachers; and (c) action information nomination used to recommend talent pool students who are interested in a topic and want to pursue it as an independent project, or to refer non-talent pool students for projects. By identifying diverse and hidden gifted students through these nomination methods, the charges of elitism can be reduced.

Gagné (2007) maintains that school administrators and gifted program coordinators should expand their selection ratio by revising the restrictive 5% rule. For example, in the Differentiated Model of Giftedness and Talent (DMGT), he maintains that the minimum threshold for any type of gift or talent should be set at the 90^{th} percentile. In other words, he argues that students who belong to the top 10% of the reference group in terms of their natural abilities or systematically honed skills deserve the label of gifted. In addition, the DMGT attempts to identify and develop students' giftedness and talent by including diverse domains (e.g., intellectual, socioeffective, and sensorimotor) and fields (e.g., arts, sports, and technology).

In summary, to identify more diverse students for gifted services in the talent development approach, intellect and giftedness should be assessed by multifaceted approaches, rather than in a one-dimensional manner (Wallace & Pierce, 1992). The following diverse concepts of intelligence and giftedness theoretically support the talent development approach, arguing that gifted education should serve to develop a wider range of talents.

Expanded Giftedness and Multifaceted Intelligence in the Talent Development Approach

Sternberg's (1997) triarchic theory identifies three kinds of intelligence. First, analytic giftedness represents analytic reasoning and reading comprehension, both of which are measured by typical intelligence tests. Second, synthetic giftedness reflects creativity, intuition, and the ability to deal with novelty. Persons who show excellent giftedness in this aspect may not show the highest IQ scores, but they have the potential to contribute to society. Finally, practical giftedness is the capacity to successfully apply analytic and synthetic abilities into daily and practical situations. The blend of these three skills can be malleable over time as intelligence is developed.

In addition, Sternberg (2000) presents seven distinguished patterns of giftedness based on the triarchic theory. These patterns involve different combinations of analytical, creative, and practical abilities. For example, an analytic creator shows strong analytic and synthetic abilities such as generating novel ideas and evaluating the values of these ideas. However, they tend not to know how to gain recognition for their contributions practically. Consequently, because the consummate balancer can apply all three types of analytical, creative, and practical abilities, this balancer has a high probability of making gifted contributions.

Renzulli's (1978) three-ring model defines giftedness as gifted behaviors rather than gifted individuals, which provides multifaceted conceptualizations of intelligence and giftedness on which the talent development approach is grounded. He maintains that gifted behavior represents an interaction among three basic human traits: above average ability, task commitment, and creativity. In above-average ability, there are behaviors such as high levels of abstract thought or rapid and accurate retrieval of information. On the other hand, specific above-average ability shows the applications of general abilities to a specific area of knowledge. In task commitment, behaviors such as hard work and determination and setting high standards in a specific area are included. Finally, creativity means fluency, flexibility, and originality of thought and behaviors that reflect curiosity (Renzulli & Reis, 1997). Consequently, the combination of the three traits is applied to general or specific performance areas, which results in gifted behaviors.

In addition, Gagné's (2007) DMGT explicitly distinguishes between gifts and talents as the following section explains in more detail. The DMGT differentiates six natural ability domains within gifts (G). Four of them are related to the mental realm (Intellectual, creative, social, and perceptual), and the other two are associated with the physical realm (muscular and motor control). In addition, the talent field shows nine talent sub-components including academics, arts, technology, or business operation. In this model, natural abilities and aptitude are transformed into talent through the talent development process defined as the systematic pursuit through a structured program or focused activities over a continuous period of time.

Tannenbaum (2003) suggests another notion of giftedness. This giftedness is defined as the ability to yield thoughts or tangible products, or to perform artistry or human services in ways that are creative or proficient (Tannenbaum, 1986). That is, he presents the definition of giftedness with a taxonomy that can answer "who," "what," and "how" questions. Specifically, he presents eight categories of gifted persons. For instance, in the category of producers who think creatively, there are novelists, artists, and composers. In the category of producers who think proficiently, there are mathematicians, computer programmers, and editors. Besides these two categories, there are six other categories such as producers who yield creative tangibles (e.g., inventors or architect) or proficient tangibles (e.g., diamond cutters or mechanics). Additionally, there are those who perform human services creatively (e.g., innovative teachers or political leaders) or proficiently (e.g., successful physicians or teachers).

Tannenbaum (2003) maintains that gifted and talented students who demonstrate advanced learning and creativity during childhood or adolescence demonstrate potential whereas high-level creativity and productivity are generally regarded as adult phenomena. As a result, for gifted learners to demonstrate giftedness with high-level creativity and productivity, the following factors are required: (a) a superior general intellect; (b) special aptitudes; (c) supportive nonintellectual factors (e.g., personality, creativity, motivation); (d) environmental supports; and (e) chance (i.e., having an excellent teacher or access to resources at critical periods of life) (Tannembaum, 2003). This conceptualization of giftedness does not limit itself to academic achievement, but is applied more broadly. Also, this giftedness distinguishes between traditional intelligence, including superior general intellect, and abilities within particular domains, including special aptitudes. In particular, this model extends the conceptualization of giftedness beyond the focus on an individual's mental ability. Tannenbaum's model also considers the nurturance of giftedness by acknowledging the roles and impact of environment and chance.

Expected Outcomes of Talent Development

The aims of the talent development approach are that gifted learners finally accomplish their eminence in their chosen areas by nurturing their strengths and interests in more diverse domains. Starting with Terman (1925), scholars have attempted to correlate giftedness during childhood or in youth with eminence in professional careers during adulthood (Feldman, Csikszentmihalyi, & Gardner, 1994; VanTassel-Baska, 1989). However, Subotnik (2009) and VanTassel-Baska (1989) have observed that gifted learners identified during childhood do not always become eminent adults, although there are exceptions. Also, eminent performers or producers often mention that they were not selected as gifted children. Therefore, doubts have been posed whether child giftedness is predictive of adult eminence.

For example, Subotnik (2003) presented the following issue: Graduates with high IQs who attended elite programs, like Terman's (Terman & Oden, 1959) study participants, had not contributed to society beyond what might be expected from their good conditions(e.g., their high family SES and high-quality education). In addition, Subotnik and her colleagues (1993) conducted research investigating middle-aged achievement of graduates with high IQs (97th percentile and above), who attended one of the most selective institutions in New York City and were from upper-middle class families with highly educated parents. They found that, similar to Terman's (1959) study participants, these students were not stellar producers, relative to their abilities and educational resources, although they were healthy and productive citizens. Thus, Subtonik et al. (2011) explicitly contend that the goal of gifted education should be to accomplish eminent performance in each domain to benefit society, as well as to achieve self-actualization.

Further, Subotnik and Rickoff (2010) argue that society has a right to expect intended outcomes from its investment to develop students' gifts. They argue that gifted children need to demonstrate attainment compatible with their potential or abilities to be labeled gifted adults. As a result, this approach argues that the goal of gifted education should be to develop the talents of gifted learners to contribute to society during their lives. Renzulli (1998) supports this purpose by stating that "Our vision of schools for talent development grows out of the belief that everyone has an important role to play in the improvement of society…" (p.107). Renzulli (2012) also stresses that gifted education for the 21st century should pursue this goal. The disconnect between giftedness in childhood and eminence in adulthood leads scholars to argue that the gifted child approach, focusing on IQ-based identification, should be replaced by the talent development approach with its emphasis on diverse talents (Subotnik et al., 2011).

The Target Students

The talent development approach includes more diverse groups of individuals because the criteria for giftedness have shifted from exclusively identifying students' mental superiority to finding gifted learners' diverse aptitude through authentic performance. In addition, the identification methods for selecting target students are diverse according to a particular line of talent development (e.g., portfolios or auditions). This approach also tries to expand the scope of identification. For example, Renzulli and Reis (1997) aim to cast a wide net and Gagné (2007) tries to include more students by setting eligibility at the 90th percentile.

Strategies: Teaching Gifted Students through Talent Development Models

In the talent development approach, teaching the gifted and the talented is based on the assumption that giftedness is a malleable construct that can be developed. Also, to demonstrate significant development in gifted students' talent areas, concerted efforts should be made in diverse settings and contexts such as home, school and community to provide increasingly advanced knowledge and skills. In particular, because this approach underscores the roles of diverse factors such as psychosocial skills or creativity in developing students' talents, it is critical to consider how home, school and community teach and nurture such traits. In the following section, these aspects will be discussed in more detail.

The emphasis of developmental giftedness. Renzulli (1986) introduced the conception of developmental giftedness. He emphasized that, because task commitment and creativity among the three traits that comprise gifted behaviors are developmental, nurturing these qualities through gifted programming is important. Unlike the gifted child approach, this approach regards giftedness as a more changeable construct that can be developed over time (Feldman, 2003; Horowitz, Subotnik, & Matthews, 2009). Gagné (2007) also stressed the transformation of natural gifts into high-level expertise or mastery in a domain, differentiating between systematically developed skills (talents) and natural abilities (gifts) in his DMGT. During this transformation process, he maintains that learning and practice play important roles. In addition, environmental catalysts (e.g., physical milieu or mentors) and intrapersonal catalysts (e.g., temperament, intrinsic motivation, and effort) hinder or facilitate the developmental process. Consequently, in this DMGT, natural abilities in diverse domains systematically transform into talents through learning and practice based on the assistance of catalysts.

Empirical research verifies this assumption that giftedness can be developed. Bloom (1985) and Rogers (2007) suggested that gifted and talented learners need daily challenges in their areas of strength to develop talents. In Bloom's longitudinal study (1985), a strong pattern was found of talented children experiencing a continuous progression toward new benchmarks when more and more difficult expectations were set by themselves or other significant adults, such as mentors or coaches. Other research makes it clear that consistent practice towards more difficult levels of skills and knowledge, coupled with inborn ability, account for excellent performance (Ericcson & Smith, 1991;Larkin, McDermont, Simon, & Simon, 1980). Rogers (2002) maintained that, if a gifted learner participates in challenging activities in his or her area of strength on a daily basis, he or she will demonstrate an average of one third to one half additional year's growth.

If Bloom's (1985) estimate of yearly growth is used, students experience closer to three years of growth in a specific talent area per year. Rogers (2007) explained that the difference in estimates is ascribed to the intensity of daily challenges and the supervision offered by able adults or parents. To maximize growth, students should be provided advanced content beyond their expected age or grade level through diverse methods such as like-performing cluster groups, early admission to university, or mentorship. Gifted students with equal abilities who are not provided with daily challenges will not improve, while the challenged group will obtain an extra full year of growth after two years.

Theoretical models in the talent development approach. This talent development approach has made efforts to delineate the pathways from childhood potential to adult achievement in specific talent domains (Davidson, 2009). In particular, the approach emphasizes that providing in-depth experiences related to gifted students' interests and strengths is critical in eliciting further engagement and more serious pursuit of these interests. To accomplish this purpose, diverse talent development models have been introduced. In particular, the following four models have served as the foundation for programs implemented in schools in the U.S. and in other countries: the Schoolwide Enrichment Model (Renzulli, 2005), the Differentiated Model of Giftedness and Talent (Gagné, 2005), the Talent Search Model (Stanley, 1985), and the Talent-Development Mega-Model (Subotnik, Olszewski-Kubilius, & Worrell, 2011).

Schoolwide Enrichment Model (SEM). One representative talent development model that implements gifted programs in the regular school settings is the Schoolwide Enrichment Model (SEM) proposed by Renzulli and Reis (1985). The SEM combined the Enrichment Triad Model (Renzulli, 1977), which concentrates on developing talent during childhood and youth, with the Revolving Door Identification Model (RDIM; Renzulli, Reis, & Smith, 1981), which attempts to identify high-potential gifted learners through more diverse nominations. Researchers have conducted studies and field-testing related to the model for almost three decades, demonstrating the model's effectiveness in school settings with diverse socioeconomic levels, regions, and sizes (Olenchak & Renzulli, 1989; Reis & Renzulli, 2003; Renzulli & Reis, 1994). This is based on a three-ring model, which was previously discussed and was related to the concept of giftedness. Based on this giftedness concept, this model present a generous talent pool identification plan and selects the top 15%-20% of students through multiple nomination methods (Renzulli & Reis, 1997).

The SEM maintains that to develop students' talent, it is important for gifted students to have an adequate sequence of educational experiences in schools following nomination by their teachers. As a result, SEM comprises the three-stage educational experiences explained in the following section. In particular, before students participate in enrichment programs, the SEM provides students in the talent pool with interest and learning preference assessments. They used either printed questionnaires or the Renzulli Learning Program (Renzulli & Reis, 2007), which allowed each student to create an on-line profile that indicates unique merits and talents. Teachers can identify the patterns of students' interests, product preferences (e.g., multimedia presentation or dramatization), and learning mode preferences (e.g., project, peer coaching or discussion). The purpose of using these methods is to know students' interests and strengths and to encourage students to pursue these interests in diverse ways.

Curriculum compacting is another important component of the SEM. The curriculum is compressed in the basic skill areas of subjects such as math, science, and social studies, which allows students time to pursue diverse enrichment activities (Renzulli, 1994; Renzulli & Reis, 1997). Related to this, one concern is whether curriculum compacting lowers students' achievement (Davis & Rimm, 2004). However, the research conducted by Reis, Westberg, Kulikowich, and Purcell (1998) demonstrated that this is not the case. They compared scores from the Iowa Test of Basic Skills (ITBS) of 335 elementary students (grades two to six) before and after instruction. Between the two tests, curriculum compacting eliminated 36% to 54% of the mathematics or language arts content. The results showed no differences between gifted students with curriculum compacting and gifted students with regular instruction. Moreover, the compacted students showed median scores over the 90th percentile on all subscales. Therefore, this curriculum compacting did not have any detrimental effects on gifted students and allowed time for other enrichment activities.

Finally, the SEM model is implemented school-wide. There are three more-or-less sequential but qualitatively different types of enrichment activities. First, in Type I enrichment, students participate in general exploratory activities, which expose students to various topics, disciplines, and interest areas beyond the regular curriculum (Renzulli & Reis, 2003). Type I experiences are beneficial because they can motivate gifted students to such an extent that they investigate and learn about their interests in creative and productive ways (Reis & Renzulli, 2010). That is, Type I activities can function to externally motivate students toward internal commitment (Renzulli, 2012). Through these activities, gifted students may find an idea for their future Type III research project.

In Type II enrichment, gifted students take part in individual or group training to promote cognitive, meta-cognitive, methodological, and affective skills. These experiences include the development of the following: (a) cognitive training (e.g., creative thinking, analysis skills, critical thinking skills and problem solving); (b) affective and character development skills (e.g., interpersonal skills); (c) how-to-learn skills, (e.g., note taking. outlining, and classifying and analyzing data); (d) advanced research skills; and (e) written, oral, and visual communication skills. Type II learning activities provide gifted students with opportunities to improve their independent learning skills. Because Type I and II activities are beneficial to all students, these activities can be integrated into the learning activities of every class (Reis & Renzulli, 2010; Renzulli, 2012).

Finally, in Type III activities, students participate in learning programs aimed at creative productivity that may lead to adult career contributions. Gifted students create products as producers rather than consumers of knowledge and art in a self-selected topic. In these activities, students are assumed to play roles of practicing professionals such as investigators, writers, and artists. In particular, these Type III activities provide students with opportunities to integrate the following learning activities: (a) applying advanced-level understanding of the knowledge and methodology used within a particular discipline, (b) developing self-directed learning skills such as planning and organizing, (c) utilizing resources, and (d) nurturing self-confidence and task commitment through project activities (Renzulli & Reis, 2003). Thus, Type III activities are referred to as "the assembly plant of the mind" (Renzulli, 2012, p.155). In Type III activities, the teacher plays the role of guiding students through clarifying problems, locating materials, providing feedback, and guiding the process whereby students are transformed into first-hand investigators or creators (Renzulli, 1994, 2012).

Differentiated Model of Giftedness and Talent (DMGT). The DMGT by Gagné (2005) places a set of variables necessary in the transformation of natural gifts into high level expertise in a specific domain. The DMGT differentiates two key concepts in the field of gifted education-gifts and talents-based on explicit, distinct, and well-operationalized definitions. Gagné (2010) suggests that natural abilities or gifts (e.g., mental abilities, social abilities, and physical abilities such as muscular and motor control) can develop through maturation and informal exercise. However, talent development and the level of expression are only partially influenced by genetic factors. In addition, environment and systematic learning exert moderating influence. Consequently, Gagné (2010) maintains that ease and speed in learning represents giftedness, whereas talents are well-trained competencies in a particular domain of human activity. The DMGT describes nine talent sub-components, such as technical or business operation.

In the DMGT, the development process has three subcomponents with multiple facets: activities, investment, and progress. By learning through specific content and a curriculum based on time, money, and psychological energy, the learners progress through a series of stages such as novice, advanced, and expert. The degree of progress is assessed through learning pace and learning peers. For example, an individual would be regarded as talented if he or she stands in at least the top 10% of learning peers with similar accumulated learning time.

The talent development process of this model is facilitated or hindered by two catalysts: intrapersonal and environmental roles. Intrapersonal catalysts are composed of five sub-components, which are grouped into two main dimensions: stable traits (e.g., physical or mental) and goal-management processes (self-awareness, motivation and volition). The DMGT's goal-management dimension concentrates on how learners define their excellence goals and work to reach them. Also, this goal management is the umbrella concept for a group of processes associated with the management of all talent-related activities. Self-awareness, the first factor of goal management, is very important in pursuing the talent development process, because knowing one's abilities and personal traits is essential in selecting appropriate talent goals. Another factor related to goal-management is motivation. Motivation is an important intrapersonal catalyst. Values, needs, interests, and passion play important roles in arousing students' motivation.

The third factor of goal management is associated with goal attainment, called volition. This includes autonomy, effort, and perseverance. The main function of these volitional processes is to direct and control intellectual, emotional, and behavioral activities to accomplish difficult goals. In particular, the following two types of strategies are used: (a) goal-related cognition that applies learning strategies to tasks, and (b) action control processes, which are knowledge and strategies used to manage cognitive and noncognitive resources to attain goals. The volitional strategies dynamically happen between committing to a goal and reaching it. In particular, an individual's volitional style varies due to individual differences in temperament and personality. This affects goal choices and action-control processes. Because it is difficult to assess volition, the relationship between motivation and volition is unclear.

Environmental catalysts also critically affect the talent development process. These catalysts comprise the following three subcomponents: milieu, individuals, and provisions. Environmental milieu refers to diverse environmental influences such as cultural and social factors. Individuals in a student's environment such as parents or teachers have great psychological influence on him or her. Provisions refer to talent development services and programs such as enrichment, curriculum, and pedagogy.

In summary, the dynamics of talent development are explained by the following points: Outstanding natural abilities are raw materials of talents. Therefore, the presence of talent implies that the students possess above-average natural abilities. However, the natural abilities can remain undeveloped potential. During this process of transformation into talents, intrapersonal and environmental catalysts actively moderate the talent development process. Learning and practice also act as moderators during the process. Gagné (2010) maintains that there is a complex causal interaction between any pairing of the five components of the DMGT (gifts, talents, environmental catalysts, intrapersonal catalysts, and developmental process). These interaction patterns will differ according to individuals as well as to which stage of the talent development process a student is in.

Talent Search Models. The Stanley Model (1976) for talent identification and development is the representative model among talent search models. The purpose of this model is to nurture individuals' talents across the lifespan based on the following principles: the use of off-level testing to identify gifted students' abilities accurately, the application of a diagnostic testing-prescriptive instructional approach (DT-PI), and the emphasis of acceleration and curriculum flexibility in core academic areas. Off-level testing is used to overcome low ceiling problems and to identify gifted students who show high-level verbal and mathematical reasoning. This testing such as ACT, SAT, or Explore is based on the assumption that gifted learners need to be assessed with tests compatible with their level of knowledge, skills, and abilities, not their chronological age or grade (Olszewski-Kubilius & Kulieke, 2008).

Students who qualify for talent searches are those with extremely high scores on in-grade standardized tests (e.g., at or above the 95^{th} or the 97^{th} percentile). However, although these high scores indicate that the students fully know the material expected for their grade level, the scores do not demonstrate what the students might know beyond the grade-level material. Thus, the in-grade standardized tests produce a ceiling effect that weakens the ability of the tests to measure gifted learners' levels accurately (Lupkowski-Shoplik, Benbow, Assouline, & Brody, 2003). Above-level tests are beneficial because they are good predictors of future academic attainment among gifted learners (Swiatek, 2007).

Following the above-level assessment, this model uses a diagnostic testing-prescriptive instructional approach (DT-PI) in placing students in special fast-paced classes (Van Tassel-Baska, 2007). The purpose of DT-PI is to provide gifted students with appropriately challenging instruction catered to their learning level. This component of the model is very meaningful because it allows an optimal match between tested ability and the level of educational programs provided by catering the learning pace and materials to the abilities of the students (Subotnik et al., 2011). Finally, the use of acceleration in core academic areas as well as curriculum flexibility in teaching students are emphasized (VanTassel-Baska & Brown, 2007). The optimal match of this model is based on the hypothesis that gifted students' motivation and task commitment are facilitated by offering the appropriate level of educational programs.

Research has supported the effectiveness of the talent search model over the past 30 years. The findings of these studies have concentrated on the benefits of acceleration provided to precocious students. They demonstrate the long-term positive effects of accelerative opportunities, which allow for participation in advanced work (Benbow & Arjmand, 1990; Brody & Stanley, 1991; Stanley, Keating, & Fox, 1974). The application of the model has been most successful in after-school and summer programs, in which students complete high school honors or AP classes in three weeks (Van Tassel-Baska, 2007). These cases provide a clear rationale regarding why acceleration should be used for gifted students (Benbow & Arjmand, 1990). In particular, the longitudinal data collected from 300 highly gifted students has shown the viability of the Stanley model. This model concentrates on the benefits of acceleration, early identification of a strong talent domain, and the need for support in educational decision making (Lubinski & Benbow, 1994).

Talent-Development Mega-Model (TDMM). In developing the TDMM, Subotnik, Olszewski-Kubilius, and Worrell (2011) considered the disconnect between giftedness during childhood and eminent achievement during adulthood (Cross & Coleman, 2005; Freeman, 2010; Subotnik & Rickoff, 2010). Also, they noted the high achievement of individuals without the aid of gifted programs (Gladwell, 2008). These findings suggest that there is a far larger base of talent than the gifted education field currently knows. This model integrates the most important components of established models, following these critical principles: (a) general and specific abilities are important and can be malleable; (b) diverse domains demonstrate varying developmental trajectories, which are described as beginning with a relatively small potential and ending in eminent achievement; (c) opportunities should be offered to young students with potential, and they should take these opportunities; (d) psychosocial variables can be critical factors to accomplish talent development successfully; and (e) eminence should be the desirable and intended outcome of gifted education.

According to the TDMM, each domain has a different developmental trajectory. For example, when a trajectory begins depends on when the skills and abilities in the talent area emerge and coalesce. The end point of the developmental arc also varies widely. The authors suggest that the developmental course of domain trajectories is influenced by training, practice, and education. For example, the peaks in the talent development of various domains are influenced by the amount of training. Gladwell (2008) stresses the importance of 10,000 hours of practice in developing expertise, citing the scientific literature (e.g., Ericsson, Krampe, & Tesch-Römer, 1993; Simon & Chase, 1973).

The TDMM emphasizes the following determining factors affecting the process of talent development, and considers that the developmental trajectories are affected by training and education. Creativity is a critical factor in accomplishing several transitions that students experience while talent develops. As the next section explains in detail, this model stresses that each domain shows a distinct trajectory in terms of beginning, peak, and ending of performance. In this trajectory, gifted learners experience some transitions of development: abilities are developed into competencies, competencies into expertise, and expertise into eminence. In particular, the type of creativity is one of the most critical features affecting the evolution of eminence. Although yielding creative performances or ideas requires the creativity of person, process, and product, the relative emphasis is different according to the level of developmental stages. For example, during childhood, a child's (person) creative approach and attitude is more emphasized, while older children hone mindsets and skills required during the process of product creation (process). At the final stage, interdisciplinary content knowledge is integrated with these mindsets and process skills, which produces creative outcomes or performance (product).

The TDMM also underscores the roles of psychosocial aspects to complete talent development. For example, the model contends that different levels and kinds of motivation such as "little-*m*" motivation and "big-*M*" motivation are required according to level of attainment. That is, "little-*m*" motivation is involved in smaller attainment (e.g., what to major in and which course to take). On the contrary, "big-*M*" motivation plays an important role as a compelling drive such as the desire to change the world or the passion for fame in achieving eminence. Also, this model stresses that a talent development process can be hindered or enhanced by psychosocial skills. For instance, weak psychological strength, low motivation, mindsets that hinder coping strategies and the lack of resilience in the face of failure can delay the talent development process. Conversely, strong psychosocial skills, optimal motivation, and productive mindsets can accelerate the process.

Finally, external and chance factors in nurturing talents are also emphasized. Above all, opportunities are a fundamental factor in talent development. For example, late entry into domains due to a lack of opportunities or gifted students' decision not to take such opportunities can prevent talent development. Also, varied external factors outside the traditional school system such as out-of-school programs or mentorships can significantly contribute to evolving talents. In summary, this model considers the impact of these various factors along with training and education in nurturing gifted students' talents. In the following section, how this model conceptualizes giftedness and what is emphasized in teaching gifted students will be explained in more detail.

Giftedness in the Talent-Development Mega-Model. The concept of giftedness in this model is different from that of traditional giftedness. In the traditional concept, giftedness has been regarded as an inborn trait of an individual that can be measured by such cognitive assessments as IQ testing (Robinson, Zigler, & Gallagher, 2000). In addition, the traditional concept focuses on gifted students' general intelligence, assuming that they have cognitive abilities such as reasoning skills that make them excel across all academic domains. Once they are identified as gifted, they remain gifted during their lifetime, regardless of their achievement. This grants exclusive status to gifted students (Dai & Chen, 2013). On the contrary, this TDMM assumes that special aptitude found in each domain, as well as general reasoning abilities are critical in developing gifted students' talents. Hence, this model considers students' acuities or propensities as signs of potential talent or aptitude in each domain. For example, musicality (Subotnik & Jarvin, 2005) or mathematical cast of mind (Krutetskii, 1976) can predict special aptitude in the domains of music or mathematics.

The TDMM also underscores that in exerting giftedness, each domain shows a distinct performance trajectory across the life span according to when the skills and abilities appear and merge. That is, the beginning, peak, and ending points of developmental trajectories in each domain vary widely. For example, adult singing voices do not develop until after puberty. In contrast, gymnastic ability diminishes in late adolescence because of physical development. Also, in academic domains, while gifted learners start its talent development in the field of mathematics during childhood, the field of psychology starts during late adolescence. In particular, giftedness evolves through several transitions wherein abilities are developed into competencies, expertise and finally eminence. During these transitions, giftedness is evaluated according to distinct criteria. For instance, at the earliest stage, giftedness is defined by potential. During adolescence and adulthood, giftedness is evidenced by demonstrated attainment and eminence respectively.

Teaching gifted students in Talent-Development Mega-Model. Most significantly, teaching gifted students for talent development begins with the assumption that abilities are malleable constructs that can be developed. Thus, this model highlights the following aspects: (a) the differentiated strategies and goals according to developmental stages; (b) the emphasis of creative skills and thinking; (c) the importance of psychosocial skills in advancing developmental stages; and (d) the participation in out-of-school programs to serve talent development. This model suggests that the strategies and goals at each stage of the developmental process should change to successfully accomplish transitions (Bloom, 1985). At the earliest stage, it is necessary for educators, coaches, and parents to encourage gifted students to be absorbed in a specific domain or topic by engaging them in that domain, capitalizing on their motivation. In the next stage, expert teachers make efforts to hone gifted students' needed skills and knowledge to develop expertise. At the final stage, it is critical to find the students' unique niches in the field. Mentoring for developing such personalized niches, styles, and methods is fundamental at this stage.

The TDMM also underscores the nurturance of creative thinking and skills. Because the type of creativity is one of the most critical features that differentiate such transitions, creativity should be deliberately nurtured by using strategies such as divergent thinking or creative problem solving. In addition, the roles of expert teachers, mentors, and coaches in developing gifted students' talents cannot be overestimated. Expert teachers facilitate such activities as engaging in a specific domain, advancing technique, and searching for one's niche in the domain. These expert teachers are not limited to educators within the school system. The instructors in out-of-school enrichment programs, talent search programs, and mentors in university or industry, and private teachers or coaches in community clubs significantly contribute to the development of the student's talents.

In addition, this model emphasizes that gifted students' psychosocial skills are a decisive factor in advancing from one stage of development to the next. For example, because diverse talents can usually be identified and developed by parents, teachers, and mentors, it is essential to have adult guidance in terms of psychological strengths and social skills. Subotnik, Olszewski-Kubilius, and Worrell (2011) suggest that one of the most critical functions of a good teacher in elite talent development is to provide gifted students with opportunities to train their psychosocial strengths, going beyond offering information, knowledge and skills in each domain. Other researchers have supported the idea that accomplishing eminence requires psychosocial strength (Simonton, 2000; Subotnik & Jarvin, 2005).

In particular, this model recommends that gifted students should proactively participate in out-of-school programs beyond the traditional school system to raise their talents to a higher level. In other words, because peaks of domain trajectories are influenced by the amount of training (i.e., the 10,000-hour rule) and education, gifted students should use the educational opportunities offered by the broader investment of social and cultural capital. In summary, this model will function as the theoretical framework of this study because it offers important insights and recommendations related to giftedness and the teaching of gifted students in nurturing their talents.

The effect and roles of main contributors to giftedness in developing talents. Because this model specifically emphasizes the roles of the following main contributors to giftedness in talent development, it is necessary to investigate these factors in greater detail. In particular, creativity, motivation, and passion especially enhance giftedness.

Creativity. This is the ability to think novelly, innovatively, and usefully, and is strongly associated with giftedness (Csikszentmihalyi, 1988; Csikszentmihalyi & Wolfe, 2000). Although there are many different perspectives regarding creativity (i.e, psychological or developmental views), some of the most salient are as follows. Amabile (1983) maintained that creativity is made up of three elements of domain-relevant skills (e.g., knowledge about the domain and special domain-relevant talent), creativity-relevant skills (e.g., appropriate cognitive style and implicit or explicit knowledge of heuristics), and task motivation (e.g., attitudes toward the tasks and perceptions of one's own motivation). These components are affected by a variety of factors, such as innate cognitive abilities, formal or informal education, training, and intrinsic motivation toward the task.

Csikszentmihalyi (1990) distinguished between *little-c* and *big-C* creativity. Little-*c* creativity refers to creativity exhibited in a narrower social context such as the office or classroom, which does not include the creation of innovative products (Plucker & Beghetto, 2004). On the contrary, big-*C* creativity indicates groundbreaking and eminent products or knowledge, altering the culture or field in a broader social context (Plucker & Beghetto, 2004; Simonton, 2010).

Why is creativity important? A 40-year longitudinal study indicated that the Torrance Tests of Creative Thinking (TTCT), which measure the behaviors that individuals use in the creative process, predicts adult creative performance (Cramond, Matthews-Morgan, Bandalos, & Zuo, 2005). Indeed, Kim's (2008) meta-analysis demonstrated that creativity test scores predicted creative accomplishments ($r = .22$) better than IQ did ($r = .17$). Further, Guilford (1968) suggested that traditional intelligence tests are not appropriate in assessing creative abilities, such as divergent thinking abilities including idea production, fluency, and flexibility. Torrance (1962) observed that if gifted programs use intelligence and achievement tests alone to identify gifted students' talents, they would not include 70% of the top 20% of creative students. In a similar study, Kim and Cramond (2007) found that 80% of students in the top 20% of creative students were missed in identification.

Related to creativity in gifted education, it is unclear if there is a relationship between intelligence and creativity. There is no consensus on how these two constructs are related in the empirical research. One of the most prominent notions related to the relationship between intelligence and creativity is the threshold hypothesis. This maintains that an IQ of 120 is a necessary condition for high-level creativity, but it is not a sufficient condition, because incremental increases in IQ do not dramatically increase individuals' possibility of creative accomplishments (Dai, 2010; Lubart, 2003).

Additionally, there are controversies regarding whether creativity is a domain-specific or generic process, which applies a one-size-fits-all procedure or mechanism to all domains related to creativity (Kaufman & Baer, 2004; Plucker & Beghetto, 2004). Simonton (2012) maintained that creativity is a generic process underlying all forms of creativity. However, creators adjust the generic process to the distinct needs that each discipline requires. On the contrary, Subotnik et al. (2011) ascribed, in part, a lack of agreement about the controversy to the distinction between childhood creativity and adult creativity. Childhood creativity is considered a person-centered trait, while adult creativity is considered process-centered and related to a product.

Does creativity predict eminence? Simonton (1977) assumed that eminence was a function of creative productivity (e.g., the number of outstanding compositions) and creative longevity (e.g., length of time that one has yielded creative work). He then tried to establish the relationship between eminence and creativity. Consequently, he found that creative productivity and longevity were predictors of eminence in a specific domain. In addition, Simonton (1999) investigated the predictors of creative eminence. He argued that four factors tend to differentiate the eminent from the noneminent. The most important predictor of achieved eminence is the total output of creative products during one's life span. In addition, Simonton (1999) suggested that as intelligence increases beyond a threshold level, an IQ of 120, the potential for creative achievement increases without assurance that the potential will be realized. Consequently, a lack of precise correspondence between intelligence and creativity implies that creativity has many other determinants besides intelligence.

Highly eminent creators tend to demonstrate distinctive personality characteristics. The most critical factor is motivation, because exceptional accomplishment requires an exceptional amount of enthusiasm, determination, and persistence. Psychopathology also plays an important role. Simonton (1999) suggested that genius and madness are related, but are counterbalanced by a few qualifications such as ego, psychosocial strength, and intelligence.

Finally, there is the question of the relationship between creativity and expertise. Research findings here are mixed. On one hand, Plucker and Beghetto (2004) suggested that excessive expertise in current knowledge and concepts of a field prevent creators from accepting outside perspectives or alternative ways, which negatively affects creativity. On the other hand, the alternative perspective maintains that deep expertise does not necessarily threaten creativity. Plucker and Beghetto

(2004) argued that flexible thinking and the ability to apply information from other perspectives or areas to a new problem are the most important abilities in accomplishing creative productivity.

Motivation. Many researchers maintained that motivation is an essential factor in attaining eminent levels of achievement (Gagné, 2005; Matthews & Foster, 2009; Nokelainen, Tirri, Campbell, & Walberg, 2007). It also plays an important role in capitalizing on talent-development opportunities (Subotnik, et al., 2011). Winner (1996) supported this argument by suggesting that the creator's most conspicuous feature is his or her persistent motivation. Besides "little-*m*" motivation and "big-*M*" motivation that were explained in the previous section, there are two different types of motivation: intrinsic and extrinsic. Academic intrinsic motivation is defined as " enjoyment of school learning characterized by an orientation toward mastery, curiosity, persistence, task-endogeny, and the learning of challenging, difficult, and novel tasks" (Gottfried & Gottfried, 2004, p.122).

Alternatively, extrinsic motivation refers to being involved in tasks because of external factors such as rewards or practical utility (Subotnik et al., 2011). Gottfried and Gottfried (1996) maintained that intrinsically motivated students accept challenges willingly, demonstrate persistence, and show high task commitment. In particular, people generally believe that gifted students are only committed to tasks due to intrinsic motivation. However, Covington and Dray (2002) found that many high academic achievers are motivated both by putting value on learning itself (intrinsic motivation) and by proving their competencies through accomplishment (extrinsic motivation).

Whereas the general perspective accepts that motivation is a construct associated with giftedness, Gottfried and Gottfried (2004) conceptualized gifted motivation as a construct itself. This is based on the following grounds. Academic intrinsic motivation independently contributes to academic achievement criteria such as objective testing, teachers' ratings, and GPA beyond the variance attributable to IQ. Academic intrinsic motivation is consistent, predictable, and stable over time. In a longitudinal study following children from infancy through late adolescence, the intellectually gifted children of the sample consistently tended to demonstrate higher motivation than their cohort peers (Gottfried & Gottfried, 2004).

Teachers can identify students' academic intrinsic motivation in the school environment. Kulik and Kulik (1984) found that when gifted learners were grouped to receive advanced instruction in specific areas, the effect on motivation was considerable (ES = .37). In particular, Hoekman, McCormick, and Gross (1999) found that gifted students who were placed in unchallenging classrooms felt higher levels of stress.

Dweck (2006) coined the term *mindset* to explain achievement motivation. This mindset describes how the beliefs that children and youth have toward intelligence and achievement can affect their response to challenges, rewards, and feedback. For almost three decades, Dweck (1975, 2000) has worked on attributions and self-theory that investigated how people develop beliefs about themselves and how these self-theories shape their thoughts, feeling and behaviors. As an outgrowth of her work, she distinguished between a fixed mind-set and a growth mind-set. A fixed mind-set, analogous to the entity theory, regards intelligence as a fixed and innate characteristic. A growth mind-set, analogous to the incremental theory, views intelligence as malleable. In particular, people who have a fixed-mindset make as little effort as possible because they generally believe that there is little they can do to change their innate abilities.

Those with a growth-mindset accept challenges and setbacks as part of the process in reaching higher goals. They establish learning goals and stick with difficult tasks by engaging in them persistently and actively. Thus, those with a fixed mindset tend to have lower achievement and self-esteem. Contrastingly, a growth mindset tends to be associated with greater confidence, risk taking, and academic success. These mindsets are critically important in developing giftedness and talents. In particular, the definition of giftedness would shift greatly if educators, parents, and others changed their fixed mindset perspectives, where students are categorized due to their inborn giftedness, to a growth mindset, where intellectual development is regarded as a dynamic and changeable construct through scaffolded support (Dweck, 2006).

In addition, mindsets affect gifted students' achievement, goals, and aspirations. For example, because students with a fixed mindset tend to feel evaluated in everything they do, they prefer lower level tasks in order to show their competency (Horowitz, Subotnik, & Matthews, 2009). Instead, students with a growth mindset perceive their challenges and failures as learning opportunities. As a result, students with a fixed mindset tend to fear failure whereas students with a growth-mindset embrace intellectual risk-tasking, leading to academic success over time (Horowitz et al., 2009). Thus, it is critical for educators and parents to encourage gifted students to have the following growth-mindsets in the talent development process: (a) defining intelligence as being malleable through educational opportunities, not as an inborn outstanding cognitive ability; (b) praising students' accomplishments gained by practice and persistence, not because of their intelligence; (c) emphasizing students' hard work, not their effortless achievement due to their intelligence; and (d) helping students accept failure as an opportunity to learn, not as a sign of a lack of ability (Dweck, 2006).

Passion. Although the notion of passion is mentioned frequently in gifted education, there has been very little research devoted to this topic. Piirto (1998) referred to passion as a "thorn" that drives the creatively productive person to become engaged in explorations of a domain. In addition, Vallerand and his colleagues (2006) maintained that there are two distinct types of passion - obsessive and harmonious - depending on how passion is internalized into an individual's identity. They found that harmonious passion is associated with positive emotion and flow because the person controls his or her favorite activity. However, obsessive passion is connected with negative emotion and impact as the favorite activity controls the person.

As a result, it is reported that harmonious passion appears to be associated with conscientiousness and extraversion while obsessive passion seems to be linked with both neuroticism and perfectionism (Vallerand et al., 2003; Hewitt & Flett, 1991; Rammstedt & John, 2007). Related to factors that support passion in academic and nonacademic domains, Larson and Richards (1991) maintained that young students demonstrate different emotions and behaviors between in-school curriculum and out-of-school voluntary programs. Adolescents reported low intrinsic motivation, low concentration and high rates of boredom in the former setting, but high motivation and concentration in the latter setting.

The reasons for these differences are related to several factors enhancing passion. When young people participate in challenging problems, engage in problem solving, and develop their methods and strategies, their motivation and passion increase (Heath, 1998; Rogoff, Baker-Sennett, Lacasa, & Goldsmith, 1995). Also, when they form supportive relationships with nonfamilial adults and make friends with their peers, including those who are intellectually similar, their passion increases. Similarly, when they perceived a moderate level of difficulty and a personally meaningful task, their passion increases (Eccles & Gootman, 2002; Renninger, Sansone, & Smith, 2004).

In particular, Fredricks, Alfeld, and Eccles (2010) suggested that there are differences between the passion of gifted students in academic domains versus nonacademic domains. Based on a sample of gifted high-school and college students in academic and non-academic areas, they maintain that gifted students in non-academic areas demonstrated more passion than they did in academic areas. Thus, they conclude that passion is more likely to be present in nonacademic than academic domains. A criticism of their claim is that they did not examine the relationship between passion and performance in specific academic domains such as history or physics, while they did ask about passion in the nonacademic domains such as sports or music (Subotnik, et al., 2011). Passion is an essential factor in driving gifted students to be involved in a specific domain. In a study of prodigies, Butterworth (2006) suggested that, "Zeal seems to be a characteristic common to all the prodigies described here" (p. 564). For example, although mathematical prodigies showed different cognitive ability in intelligence tests, they all demonstrated an obsession with numbers.

The Results of Talent Development

This section will discuss outcomes in the use of talent development in academic and nonacademic domains. How out-of-school activities such as talent search programs and competitions for talent development affect gifted students' achievement in academic domains will be emphasized. Also, in nonacademic domains, because there is little research about the results of gifted students' talent development, the predictive validity of talent identification will be addressed.

Academic domains. As the previous section indicates, regular schools frequently implement acceleration and enrichment programming to develop gifted students' talents in academic domains. However, this talent development approach also positively encourages students to experience out-of-school activities such as talent search programs and mentorship with experts in universities or industries (Dai & Chen, 2013). Csikszentmihalyi (1993) supported the suggestion emphasizing that productive use of time outside of school is a key indicator of creative and productive adolescents. Lubinski and Benbow (1994) demonstrated the benefits of talent search programs related to gifted students' achievement in their areas of strength through longitudinal data from 300 highly gifted students. Also, mentorship is beneficial for the gifted to explore their areas of talent in a ceilingless environment (Purcell, Renzulli, McCoach, & Spottiswoode, 2002). In the following section, the results of academic talent development will be explained in more detail.

Competitions such as the Mathematics Olympiads provide gifted students with opportunities to nurture their exceptional talents in math and science. For example, Campbell and Walberg (2011) maintained that a number of educators employ competitions at the grassroots level to develop gifted students' talents. Basically, all competitions are held based on the following assumptions, which comprise a distinctive rationale. First, talented students should be identified as early as possible. Second, competitions are necessary because regular school settings tend to not provide differentiated curriculum or resources in stimulating extraordinary students. Third, competitions attract gifted students and motivate them to develop their talents early. Finally, the students' talents are expected to contribute to society.

The American Olympiad studies include the Mathematics, Chemistry, and Physics Olympiads. Campbell and Walberg (2011) investigated what skills educators should teach and what preparations are required in order to win these academic competitions. They found that, because the topics of these tests are taken from current research, students need to accumulate extensive amount of current knowledge in these three fields. Students should be able to read the current research and analyze problems that scientists, engineers, and mathematicians deal with in these domains. Some critics argue that, because so few winners are selected from those competitions, the competitions themselves should be dismissed. However, Campbell and Walberg (2011) contended that nonwinners gain in-depth subject knowledge and ability to comprehend research literature. These researchers investigated the achievements of 345 adult Olympians. This sample was composed of Olympians who participated in the Mathematics (N=125), the Chemistry (N=140), and the Physics (N=92) Olympiad. They ascertained that 52% of these Olympians earned doctorates and pursued careers in technical domains, ultimately benefiting society.

In addition to competitions, educators use other diverse strategies to develop students' talents. For example, many universities use diverse talent search programs to support precocious students' talents in science, technology, engineering and math

(STEM) domains, as well as verbal domains such as writing and literature (Swiatek, 2007). In particular, talent search programs use off-level testing to identify precocious and highly gifted students. Research supports the predictive validity of this off-level testing. Many longitudinal case studies investigating the results of talent searches have documented impressive outcomes among seventh and eighth graders who earned high test scores on the SAT (e.g., Lubinski & Benbow, 1994; Stanley, 1978; Stanley & Benbow, 1986). These precocious students went on to prestigious undergraduate and graduate schools, obtained advanced degrees, and became prominent in their professional fields.

Despite these evident successes, concerns exist about the findings of these case studies. Although the studies found that highly gifted students identified through off-level testing demonstrated excellent performance in their fields, the studies had no comparison groups. Therefore, it is unclear whether such success was limited to those highly gifted students or whether other groups such as more moderate off-level test scorers could show the same success (Swiatek, 2007). Thus, in response to this concern, many studies began to compare talent search participants with those students who received comparable test scores but did not attend talent search programs (e.g., Benbow, Perkins, & Stanley, 1983; Swiatek & Benbow, 1991). These new studies found that participants in talent search programs outperformed nonparticipants in academic achievement.

However, the studies did not find whether students with lower test scores in off-level tests could succeed equally well. First, Bartkovich and Mezynski (1981) studied the performance of seventh graders with high SAT scores in a fast-paced summer pre-Calculus class. This group was composed of students from two different years. One group from 1978 scored at least 600 on the SAT-M and had an 1100 composite score, and the other group from 1979 scored 500 on the SAT-M and had a 1000 composite score. These classes first tested students' level of mastery and then provided instruction focused on material not yet mastered. All students benefited from the fast-paced math classes, but students who earned high SAT scores in 1978 had more pre-Calculus knowledge prior to beginning the programs in spite of no formal training in the subject. Thus, this study indicates that the above-level SAT-M scores measured meaningful differences among gifted math students, which had implications for their learning.

Using above-level SAT-M scores, Benbow (1992) identified students whose mathematical ability was in the top 1%. Then she compared the long-term academic performance of the top and bottom 25% of students within this top 1% group. Ten years after the off-level testing, she compared the two groups in terms of 37 achievement-related variables such as course-taking and graduate school attendance. The higher scoring group demonstrated better performance on 34 variables. This finding implies that it is not valid to assume that all gifted students have the same educational needs or trajectories. Even among students in the top 1% in ability, achievement can be meaningfully different.

Another longitudinal study showed the results of talent development through talent search education programs. Participants in the first Study of Mathematically Precocious Youth (SMPY) were investigated in terms of their achievement not only at the end of the class (Fox, 1974), but also 8 years (Benbow et al., 1983) and 18 years (Swiatek & Benbow, 1991) after the class ended. These studies compared the achievement of these gifted students and their eligible peers who did not attend the programs. Also, they compared students who learned in a very fast-paced class and a somewhat slower-paced class. The results showed that students who finished the class at the fastest pace had higher SAT scores in high school, took more advanced mathematics courses, attended highly ranked colleges, and entered universities at a younger age (Benbow et al., 1983; Swiatek & Benbow, 1991). Additionally, female participants were more likely to pursue graduate study (Swiatek & Benbow, 1991).

Nonacademic domains. Unlike academic fields, there is little research about the results of gifted students' talent development in nonacademic domains in the field of gifted education. However, Gray and Plucker (2010) examined whether the identification of athletic talent during childhood or adolescence can be connected with excellent performance in athletics during adulthood. They maintain that, although the predictive validity of talent identification strategies is a critical issue and in high demand, it is not easy to determine. Although professional football teams utilize several skills tests in each draft decision in an attempt to identify future stars, the predictive validity of these tests is questionable.

For example, there are many cases of professionals who succeed in the field despite predictions of mediocrity based on their physical disadvantages. Also, there are many cases of the reverse. Thus, Gray and Plucker (2010) suggested the possibility that, although many coaches believe they should identify an individual with excellent athletic potential, they actually assess his or her talents with indicators such as current physical precocity. As a result, late bloomers or even children with inferior physical conditions may not have the opportunity to participate in these programs. Thus, these authors argue that appropriate knowledge about how to identify an individual's potential and nurture their talents is a critical factor in predicting the results of gifted students' talent development.

Teachers' Perceptions of Gifted Education

In this section, teachers' perceptions about gifted education will be described. In particular, discussion will address how teachers' perceptions and their biased perceptions influence the identification of gifted students. In addition, the unique perceptions of Korean teachers about gifted education will be explained.

The Importance of Teachers' Perceptions

Classroom teachers have unique perspectives on their students because they can observe them in a variety of situations and conditions. Thus, teachers' perspectives and judgments can function critically in deciding who will be selected for gifted services. This is why many school districts include teachers' referrals as a part of the total identification system, even as diverse tests play important roles in choosing gifted students (Davidson Institute, 2006). Consequently, it is critical to investigate how teachers' beliefs, stereotypes, biases, and expectations affect their referral of gifted students (Siegle & Powell, 2004).

Although teachers' recommendations are emphasized in the identification process, debate about their qualifications has been growing during the last half-century (Gagné, 1994; Hoge & Cudmore, 1986; Pegnato & Birch, 1959; Renzulli & Delcourt, 1986; Rohrer, 1995). For example, Pegnato and Birch (1959) argued that classroom teachers were not reliable in identifying the gifted and the talented in their classrooms because they were not good at selecting students with IQs over 130. On the other hand, some researchers suggest that teachers are skilled and effective in the identification of gifted students (Gagné, 1994; Hoge & Cudmore, 1986; Rohrer, 1995).

In addition, some studies have shown that teachers are effective in rating students' behaviors (Hunsaker, Finley, & Frank, 1997; Renzulli et al., 1997).

Regarding this issue that students' academic achievement is affected by teachers' perceptions, Pringle, Lyons, and Booker (2010) investigated how African American high school students in the U.S. perceived teachers' expectations. To understand the influence of teacher expectations on the academic achievement of African American students, researchers interviewed 48 African American senior from two high schools. The following points were found. First, the African American students interviewed for this study perceived teacher expectations as indicating whether their teachers authentically cared about them or even liked them. Second, over one-half of the African American students in this study agreed that race or ethnicity was a factor that affected the way teachers viewed them. Finally, many of the participants pointed out that they could perceive that some of their teachers had lower expectations for African American students. Some students perceived that teachers did not expect high quality work from African Americans as much as they did from White students, which was expressed by word or deed. Based on these results, Pringle, Lyons, and Booker (2010) maintained that, because teacher expectations can mean different things to different individuals, it is important for teachers to be aware that their expectations can be an influential factor in a student's academic achievement.

The Results of Teachers' Biased Perceptions

To specifically find teacher biases when nominating students for gifted services, Siegle and Powell (2004) constructed a series of student profiles based on Tannenbaum's (1997) concept of producing and nonproducing gifted students.

Researchers defined producing students as those who completed and submitted schoolwork and nonproducing students as those who did not. Teachers indicated which students' profiles should be identified as gifted. Generally, students who completed schoolwork obtained higher rating scores than students who did not. The educators tended to value problem- solving skills more than computation skills, although they perceived that mental computation ability indicated the characteristics of gifted students because it showed their abstract thinking and good memory. Teachers believed that gifted students enjoyed reading and they prioritized students with broad knowledge bases over their counterparts who had a passion for a single subject.

Consequently, Siegle and Powell (2004) contended that teachers should be trained to recognize diverse areas of talent in students, because such inaccurate perceptions of giftedness can negatively affect the identification of authentically gifted students including students with talent in one domain. Siegle (2001) emphasized this point, suggesting that "Efforts should…be made to help teachers understand that there isn't an all-purpose gifted child, and children do not need to exhibit gifted characteristics in all aspects of their lives" (p.24). These suggestions speak to the importance of this study because, by investigating teachers' perceptions about giftedness and teaching gifted students in relation to talent development, teachers' inaccurate perceptions can be trained.

Researchers maintain that teachers tend to show biased perceptions about giftedness in identifying minority gifted students. For example, Speirs Neumeister, Adams, Pierce, Cassady, and Dixon (2007) investigated the perceptions of fourth-grade teachers about giftedness and identification procedures. These were teachers of gifted students in an urban school system with a high proportion of minority and economically disadvantaged students. The purpose of the study was to elicit implications related to selecting diverse gifted students based on the perceptions of these teachers. Twenty-seven fourth-grade teachers participated in the study, and 93% of the respondents were Caucasian. First, teachers described their personal definitions of giftedness including the characteristics and behaviors of a gifted child. Then, after writing the name of each gifted child specifically, the teachers were instructed to write about how they identified each student, what characteristics and behaviors they observed in the gifted child, and what the concerns were about the child's qualification for the gifted services. As a result, these 27 teachers identified a total of 184 students for the gifted services, with 51% of those selected being minority students.

Experienced gifted teachers in the study maintained a narrow conception of giftedness. Despite their experiences with gifted minority students, the teachers did not recognize how culture and environmental factors might affect the demonstration of giftedness in minority and poor students. Teachers also tended to be less likely to recognize the strengths of minority and poor students, compared with other gifted students. Moreover, although the minority students were selected based on the same criteria as White students, one-third of the teachers still expressed concerns about these students' qualifications due to skill deficits, work habits, and behavioral problems. Researchers maintain that teachers tend to show biased perceptions about giftedness in identifying minority gifted students.

Geake and Gross (2008) explained teachers' negative attitudes toward academically gifted students. They maintain that teachers do not celebrate academically gifted students as enthusiastically as they emphasize precocious athletic or musical talents. For example, based on teachers' inaccurate views toward intellectually gifted students, most teachers oppose acceleration of a gifted child because they would not fit in socially after acceleration (Geake & Gross, 2008). However, this is the opposite of how outliers in sports or music are treated.

Colangelo (2002) contended that as a contemporary feature of Western society, the pressure that requires gifted students to hide or moderate their academic achievement is connected with hostility toward intellectual elites. In addition, Gross (1997) found that there are negative stereotypic views that gifted students are arrogant, overconfident and selfish. This negative attitude not only restricts the provision of differentiated education but also inhibits the effectiveness of continuing professional development in gifted education (Eyre & Geake, 2002). Because this is problematic, Geake and Gross (2008) maintained that teachers' unconscious negative attitudes about students' high intelligence can be reduced through professional development by educating them on the characteristics of gifted students and their learning needs. Also, they contend that it is important for teachers to participate in professional development that fosters accurate perceptions about gifted students' needs and characteristics.

Negative perceptions of educators yield more detrimental outcomes for minority groups. Ford and Grantham (2003) suggested that the underrepresentation of diverse students in gifted education is primarily due to educators holding a deficit perspective about minority students. A deficit perspective means that educators possess negative, stereotypic and counterproductive views along with low expectations of culturally diverse students. They further argue that this biased thinking is generally prevalent in perceiving intelligence, assessing students, deciding policies and practices such as teacher preparation programs, and communicating with diverse families and communities. For example, in terms of intelligence, little consensus exists among educators and scholars about how to define intelligence. A contentious aspect around intelligence is the debate over the relative contributions of nature versus nurture. In particular, advocates for nature's majority contribution maintain that intelligence is static and a function of genetics, whereas the nurture position states that intelligence can be malleable.

In the center of this nature-nurture debate, there are controversial perceptions about African American students. Some scholars and educators perceive that African American or other minority students are intellectually inferior. Thus, if a certain educator holds the position of nature, he or she is not likely to recommend minority students for gifted services (Ford & Grantham, 2003). In particular, this point is becoming a more critical issue in Korea because Korea is being gradually internationalized and the diversity of the student population is increasing in schools.

The effect of these perceptions appears explicitly in data. In the U.S., European American students make up approximately 56% of the total school population but almost 68% of the students in gifted and talented education (U.S. Department of Education, Office for Civil Rights, 2006). Although African American students make up 17% of the student population, their proportion is only 9% of gifted and talented students. Similarly, Hispanic American students comprise 20% of the total school population, but only 12% are included in gifted and talented education. American Indian students are also underrepresented in gifted and talented programs. They make up 1.26% of the total school population, but only 0.97% are included in gifted education. Although the composition of minority students with different cultural backgrounds is gradually increasing in Korea, particularly in rural areas, the population is underrepresented in gifted programs (Park, 2013).

The Unique Perceptions of Korean Teachers on Giftedness

According to the literature, Korean teachers generally share a set of common perceptions related to giftedness. These perceptions consist of Korean teachers' narrow identification related to giftedness, their conflicting perceptions related to intellectual giftedness, and their low reliance on teachers' recommendations and observations as identification methods.

Very narrow identification of giftedness. Teachers tend to perceive a very narrow segment of the student population as gifted. For example, Choe and Park (2004) surveyed the perceptions of 174 Korean elementary teachers in eight schools in the following five domains: (a) general perceptions toward general gifted education, such as its necessity and effectiveness; (b) characteristics of gifted students; (c) identification of giftedness; (d) gifted programs; and (e) teachers of the gifted. A majority of participants (72.2%) regarded only one student in their class of 30-47 students as gifted. Thus, these researchers maintain that the proportion of gifted students that teachers perceived was very narrow, compared with theoretical models that suggest 10%-20% of the student population are gifted (Gagné, 2007; Renzulli & Reis, 1997).

Hwang and Kim (2009) investigated how the perceptions toward gifted science education differed among 266 science teachers in science magnet schools, gifted science education academies as after school programs, and regular schools. Regarding what percentage of students should be identified as gifted, the participants' perceptions were different. Nearly half (41.4%) of participants responded that the upper 1% of the student population should be identified as gifted science students. Specifically, 48% of regular school teachers identified the upper 1% of the student population as gifted. Instead, 31.7% of teachers in science magnet schools and 29% of teachers in after-school gifted science education academies identified the upper 1% of the student population as gifted.

This result implies that more teachers in regular schools than those in science magnet schools and after-school gifted science education academies perceived the smaller scope of the student population as gifted. It can be inferred that teachers in science magnet schools and science after-school gifted programs perceived that a wider scope of students can be gifted. In addition, whereas 18% of regular school teachers identified the upper 3% as gifted, 32% of teachers in science magnet schools and 30% of those in gifted science after-school programs identified the upper 3% as gifted. These results indicate that regular school teachers had the highest criteria for identifying students.

Jung et al. (2013) conducted a qualitative study, investigating the differences in perceptions of giftedness between Korean general all-day teachers and gifted teachers. They investigated the frequency of words that appeared in recommendation letters for gifted services by general teachers and in discussions about giftedness by gifted teachers. Words such as passion, science, rewards, and test scores appeared most frequently. In particular, 76.9% of recommendation letters by general teachers mentioned that the recommended students showed high test scores in every subject. This finding implies that it is very difficult for students not showing high scores in every subject to be recommended. In summary, Korean teachers tend to perceive as gifted only those students who stand in the upper 1% of the student population or who show very high test scores in every subject rather than in one domain.

Conflicting perceptions of intellectual giftedness. Korean teachers tend to show relatively conflicting perceptions about intellectual giftedness. In particular, teachers tend to strongly connect giftedness with intellectual characteristics. For example, Jung et al., (2013) maintained that general teachers often associate giftedness with students' ability to demonstrate high test scores in every subject, emphasizing their intellectual achievement. Also, Choe and Park (2004) investigated the frequency and percentage of teachers who accurately know the intellectual and socioemotional characteristics of gifted students. They found that 63% of teachers in their study accurately answered questions related to intellectual traits, while 30.2% accurately answered questions associated with socioemotional characteristics. They interpreted these results as an indication that most teachers have more accurate perceptions about intellectual characteristics of gifted students than about their socioemotional features.

Surprisingly, teachers demonstrated anti-intellectualism related to academic brilliance (Lee, Cramond, & Lee, 2004). Lee et al. (2004) investigated Korean teachers' attitudes toward academic brilliance as a replication of a study designed by Tannenbaum (1962), by asking them to rate eight hypothetical student types who varied in their combinations of athleticism, effort, and academic ability. Cramond and Martin (1987) previously found that both preservice and in-service teachers in the U.S. showed negative attitudes about brilliant students. Lee et al.'s (2004) study revealed that, like American teachers, Korean teachers tended to demonstrate more positive attitudes towards students with sport-mindedness than academic excellence. Also, the surveyed Korean teachers preferred nonstudiousness to studiousness and did not show any preference toward academic smartness.

Moreover, they all gave brilliant-nonathletic students the lowest rating. In particular, gifted girls tended to be the lowest rated because teachers perceived them as brilliant-nonathletic. However, this perception may contain gender bias because girls are rarely considered as athletic as boys. Consequently, this study showed that if gifted students met this brilliant- studious-nonathletic description, teachers had negative and biased attitudes toward them. These findings demonstrated Korean teachers' conflicting attitudes and perceptions about intellectual giftedness. Whereas they admitted that giftedness is mainly connected with intellectual aspects, they showed biased and negative attitudes towards brilliant and studious gifted students.

Concerns about identification methods. Korean teachers tend to have concerns about current identification methods, mainly identification through teachers' recommendations and observations. For example, Hwang and Kim (2009) reported that, although all students at the science magnet schools they studied were identified as gifted when they entered the schools, teachers currently perceived that only 31.7% of the admitted students seemed to be gifted. The researchers maintain that this finding implies that the identification methods might be flawed. They suggest that the criteria to identify science gifted students should be consistent and clear. In the future, research should be conducted to more precisely identify science gifted students. Additionally, Choe and Park's (2004) investigation of elementary teachers' perceptions about gifted education suggest that teachers thought the recommendations of their colleagues, students' parents or even themselves were not reliable. Instead, they mainly depended on creativity and intelligence tests to identify gifted students.

Han and Lee (2011) studied the identification methods of observation and recommendation. To find out if these methods were effective, they investigated the importance and degree of implementation of this system through the perceptions of gifted teachers responsible for identifying gifted students. They employed concept mapping to do so (Paulson & Worth, 2002). In all, 112 gifted teachers in the school system completed the survey. The gifted teachers perceived that fairness and professional knowledge are the most critical factors to successfully identify students through observation and recommendation. However, these researchers contend that the system is rarely implemented because fair and appropriate criteria do not exist (Cheo, 2010; Lee & Han, 2009; Yoo & Jung, 2010). Han and Lee (2011) presented additional concerns that, although observation and recommendation are used as identification methods, teachers exclusively employ recommendation without using observation.

Perceptions of Korean teachers about how to teach gifted students. When Choe and Park (2004) investigated elementary teachers' perceptions about how to teach gifted students, 87.4% of teachers reported that gifted education is necessary. However, 58.7 % of participants indicated that the current school system was not appropriate in developing the potential of gifted students. Finally, in relation to teaching gifted students, 75.5% of teachers with experience in gifted programs responded that they would use the gifted programs in general classes or enrichment classes for gifted students. However, these elementary teachers showed low comprehension of specific teaching strategies for gifted students such as Creative Problem Solving (CPS), acceleration, and curriculum compacting.

Hwang and Kim (2009) investigated the perceptions of science teachers from science magnet schools, after-school gifted science education academies, and regular schools. Researchers asked who should take on educating science gifted students. Out of the total number of participants, 80% responded that the institutions where the teachers work should educate gifted students, while 20% responded that university professors or researchers should also participate in their talent development. In addition, Jung et al. (2013) believed that teachers should help to develop gifted students' innate abilities or talents, emphasizing motivation and self-satisfaction. Overall, Korean teachers believe that teachers, rather than other professionals, should take on the main responsibility and roles in gifted students' talent development.

Noh, Kim, and Beck (2008) investigated the relationship between science high school gifted teachers' beliefs about gifted education and their classroom practices. In this qualitative study, researchers conducted interviews with three science teachers with different work experiences and observed the teachers' practices. They found that according to the degree of teachers' work experience, their beliefs and actual practices were different as follows. First, the teacher (A) who had worked longest showed a teacher-centered belief and his practices were adjusted to this belief. The teacher (B) with moderate experience showed conflict between his beliefs and practices. Although he had student-centered beliefs, his class was composed of teacher-centered classroom practices. This mismatch between teacher beliefs and actual practices was similar to the results of other studies (Yang, Han, Chae, Oh, & Cho, 2005; Haney & McArthur, 2002). However, teacher C, with the least work experience, showed student-centered beliefs, and her classroom practices matched her beliefs. In addition, each teacher showed differences in how they viewed the gifted. For example, teacher A did not perceive the characteristics of gifted students as important and did not consider these characteristics in teaching gifted students. However, teachers B and C perceived that because gifted students have high task commitment and high intellectual ability, they can participate in self-directed learning.

Noh et al. (2008) investigated the reasons for a teacher's mismatch. Due to the emphasis that students, parents and the principal placed on preparation for entering prestigious universities, teachers' focus shifted from implementing gifted education that emphasizes student-centered learning to providing students with knowledge based on teacher-centered learning. This perception is supported by the comments of teacher A, whose practices focused on raising test scores.

Consequently, this study provides some insights related to teachers' accommodations for gifted students' talent development. Three teachers believed that teachers' accommodation in teaching practices is necessary for gifted students. However, in practice, their beliefs related to accommodation were not necessarily implemented, because the actual classroom environment or the expectation and/or requirements of teachers did not allow high accommodation. This study shows that even in science magnet schools in Korea, an environment in which teachers can implement high accommodation was not provided. More positive efforts are required such as changing teachers' perceptions, providing teachers with teaching methods related to gifted education, and making environments where teachers' beliefs and actual practices can be matched (Noh et al., 2008).

Research Related to Teachers' Perceptions of Talent Development

Research regarding educators' perceptions of talent development is scarce. Thus, the scope of the literature review was expanded to include other sources such as dissertations. Research articles about the perceptions of coaches and experts in each field who participate in the training of gifted students were also included. For example, Jo (2007) investigated what factors comprise the giftedness of ballet. This study was conducted through two processes. First, 14 professionals in ballet participated in interviews and open-ended surveys based on their experiences to identify components related to ballet giftedness. Factors that affect the giftedness of ballet were categorized into five components: body, artistic sensitivity, ballet intelligence (cognitive abilities related to ballet), psychology, and environment. These five components were composed of several subcomponents.

As the second step, 15 ballet experts were selected to assess the relative significance of factors. These professionals were directors in ballet corps or choreographers, and all were selected as gifted students at one point in various countries. The researcher conducted the two-way pair-wise comparison survey with the 15 ballet experts. The researcher analyzed the survey to identify the relative importance of these five components of ballet giftedness. It appears that these factors are required to show ballet giftedness: (a) artistic sensitivity (e.g., musical aptitude or feeling) at 40.2%; (b) body (e.g., coordination of movement or physical figure) at 25.3%; (c) ballet intelligence (e.g., understanding, the ability of analysis, memory, creativity) at 17.5%; (d) psychology (e.g., emotion, personality, and motivation) at10.4%; and (e) environmental factors (e.g., education or significant figure) at 6.6%. The professionals regarded artistic sensitivity as the most important factor, followed by physical condition.

In addition, Kim (2013) investigated Korean teachers' perceptions of music talent development. Eighteen music teachers from 12 institutions worked in a government-funded music center to develop the talents of musically gifted students. This study was conducted based on semi-structured interviews that had no specific questions, but queried about the following general themes: (a) The characteristics of musically gifted students; (b) their education; (c) the roles of parents; (d) the roles of teachers; and (e) the socioemotional support for them.

The music teachers came to a few conclusions. First, parents are very important in recognizing and nurturing music giftedness, but their excessive interest and intervention prevent gifted students from developing their talent. Second, teachers are the second most important figures in nurturing students' giftedness, especially in identifying each student's unique personality and temperament. Third, excessive emphasis on performance technique prevents recognition of gifted students' potential. Finally, the continuum of music education for gifted programs is not provided. Some respondents maintained that government should organize music education programs more systematically, based on the understanding of music giftedness.

As a pilot study of a larger project to explore the nature of talent, Wu (2005) investigated Chinese teachers' perceptions about talented students. He explains that Western-based research describes talent development as moving from nature into a mixture of nature and nurture. On the contrary, the general body of Chinese research indicates that talent development moves from nurture into a mixture of nature and nurture. He suggests that this difference is due to the cultural backgrounds. The purpose of Wu's pilot study was to explore whether this cultural perspective of talent performance was present in the pedagogical beliefs and practices of Chinese teachers. Participants were 14 secondary school teachers with experience teaching talented students.

Most of these interviewees believed that individual's innate abilities are not as critical in talent performance as nongenetic factors. They strongly believed that diligence, effort, and specific training can supplement insufficient natural talent. Thus, they perceived that the identification of giftedness is less important than the development of human potential to the highest level. Participants perceived that teachers play increasingly significant roles in students' academic performance during school years. Additionally, they perceived that psychosocial factors such as interest, motivation, and perseverance can be trained through parents' and teachers' emotional support and instruction. Consequently, this study provides an important insight regarding Chinese teachers' perceptions about key factors affecting gifted students' talent development. By showing that teachers' roles are important in talent development, Wu's (2005) study confirms the value of the present study investigating Korean teachers' perceptions of talent development.

Conclusion

In the field of gifted education, the gifted child approach emerged around 1925. This approach looks upon giftedness as an innate quality identified by cognitive assessment (Robinson, Zigler, & Gallagher, 2000). However, the approach was criticized for various reasons. For example, it uses cut-off scores that are too strict, only selecting 3%-5% of a school's student population as gifted. Due to these concerns, the talent development approach gradually appeared as an alternative approach in order to provide more students with gifted services. Because this new approach is based on expanded and multifaceted conceptions of intelligence and giftedness, it is able to provide students with talents in nonacademic, as well as academic domains, with gifted services. To nurture the talents of gifted students, various talent development models have been presented, such as the Schoolwide-Enrichment Model (Renzulli, 2005), the Differentiated Model of Giftedness and Talent (Gagné, 2005), the Talent Search Model (Stanley, 1985), and the Talent-Development Mega-Model (Subotnik et al., 2011).

This research is based on one of these talent models, the Talent-Development Mega-Model by Subotnik et al. (2011). According to the literature, Korean teachers tend to perceive a very narrow scope of the student population as gifted. Also, teachers show inaccurate knowledge about the concept of giftedness, considering factors such as the SES of parents and students' good attitude during class time, rather than their talents (Jung et al., 2013). Furthermore, according to the Third Comprehensive Plan for Korean Gifted Education Improvement (Korean Ministry of Education, 2013), 83% of Korean gifted programs focused on the domains of mathematics and science, while programs for the gifted in other domains, such as music and athletics, tended to be disregarded. In this situation, students who may not be included in the narrow definition of giftedness can be excluded from opportunities to participate in gifted services.

If Korean teachers' perceptions remain within the traditional perception of giftedness and talent development support, without progressing toward a new talent development approach, diverse and valuable talents of gifted students will not be developed appropriately. The researcher selected the more informed TDMM (2011) which integrates previous research demonstrating why gifted students' talents should be nurtured. This is because this model can guide the investigation of teachers' perceptions about giftedness and teaching gifted students in relation to talent development based on more knowledge and information. In particular, this study focuses on the perceptions of elementary teachers because they are more likely to provide trustworthy empirical data. Because most gifted programs are implemented in elementary schools rather than secondary schools, gifted education is directly connected with elementary teachers' actual practices.

This literature review functions as a strong theoretical ground for the development of a survey, which will be discussed further in Chapter 3. By providing an overview of the traditional gifted child and new talent development approach related to giftedness, this literature review created a theoretical basis in order to answer the first research question, investigating Korean elementary teachers' perceptions about giftedness.

Also, this literature review provided the theoretical ground needed to answer the second research question investigating Korean teachers' degree of support for gifted students' talent development. This is because it indicated which practices should be accommodated to best support the development of talent among gifted students, based on talent development models and beneficial teaching strategies for the gifted. In conclusion, this literature review provided the critical theoretical base for conducting this study.

CHAPTER 3

METHOD

Two research questions were created to guide this study of Korean teachers' perceptions of giftedness and support for talent development:

1. *What are the perceptions of Korean elementary teachers about giftedness in terms of talent development?*
2. *What perceptions do Korean elementary teachers have regarding teaching gifted students related to talent development?*

Epistemological Underpinnings

As a starting point for the research design, two questions needed to be addressed: (a) what methodologies and methods would be employed in this research? and (b) how does the purpose of the research justify the methodology? (Crotty, 2010). These questions were related to diverse factors, such as the assumptions about reality, human knowledge, and the kind of knowledge attainable by this study. In this research, the epistemological stance used was objectivism (Crotty, 2010), the view that things exist as meaningful entities having objective truth, which scientific research can uncover. This epistemology aligns with the positivist stance as a theoretical perspective. Thus, this research was conducted using survey research based on the tenets of positivism (Crotty, 2010), followed by a statistical analysis of the data collected.

In particular, survey research was selected from among the diverse positivist research methodologies available, such as experimental research and causal-comparative research, for several reasons. First, survey research is defined as

collecting data to answer questions about people's thoughts on some issue (Gay, Mills, & Airasian, 2009). Also, Gay et al. (2009) explain "survey research can be used to gather information about a group's beliefs, attitudes, behaviors, and demographic composition" (p.176). Thus, because the purpose of this research was to investigate Korean elementary teachers' perceptions and attitudes toward gifted education related to talent development, survey research methodology was the most appropriate. Moreover, as previously explained, the Korean government emphasizes teachers' recommendations and observations as an identification method. Thus, it is critical to better understand teacher perspectives about giftedness and support for talent development.

In the past, teachers had little influence on selecting gifted students because their opinions or evaluations were hardly considered in the identification process. However, recently, investigating this issue has become more important because teachers' perceptions can now directly affect who will receive gifted services. For this purpose, survey research is very useful, because it can collect abundant data in a relatively short time, compared with other research methodologies such as a case study investigating a few participants' perceptions in detail. Also, survey research is good to compare perceptions among subgroups. This information could be helpful in deciding policies or practices related to the administration of gifted education (i.e., professional development of teachers).

Instrumentation

A questionnaire for this study was developed according to the following processes. The overall structure of the questionnaire was based on the conceptual framework of the TDMM by Subotnik and associates (2011). Through this theoretical lens, the questionnaire sought to answer the two research questions. The questionnaire was based on the following two constructs: traditional or contemporary giftedness (TCGiftedness) and talent development support (TDS). To investigate Korean elementary teachers' perceptions about giftedness and teaching gifted students related to talent development, two themes were pursued: (a) whether Korean elementary teachers' perceptions of giftedness oriented toward the traditional gifted child or the contemporary talent development approach, and (b) to what degree teachers support talent development in teaching gifted students.

Survey questions asking teachers about their perceptions of the characteristics of gifted students (Part 3), giftedness and intelligence (Part 4), and the development of giftedness in talent domains (Part 5_2 & Part 7_7) attempted to identify Korean elementary teachers' perceptions about the construct of TCGiftedness. According to the degree of the teachers' agreement, this survey aimed to identify whether or not their perceptions of giftedness were oriented toward the traditional or contemporary approach. In addition, survey items tried to measure the construct of TDS, asking teachers for their perceptions about teaching gifted students in academic domains (Part 6) and nonacademic domains (Part 7 except Part 7_7), and providing options for gifted services (Part 8). In other words, these items attempted to investigate their perceptions of appropriate accommodation of teaching practices for talent development.

The questionnaire included eight sections. Parts 1 and 2 collected respondents' demographic information in order to investigate the differences in teachers' perceptions among diverse demographic groups. Additionally, information about participants' schools was collected to compare the differences in teachers' perceptions according to school situations, such as the presence or absence of gifted programs. Part 3 attempted to answer the first research question about giftedness. Through questions related to the characteristics of gifted students (i.e., domain-specific giftedness) in Part 3, the researcher tried to identify whether Korean teachers' conception of giftedness leaned more toward the traditional or contemporary approach.

Part 4 investigated Korean teachers' perceptions about giftedness and intelligence that became the theoretical base for their perceptions related to talent development. More specifically, these items documented Korean teachers' perceptions regarding the malleability of intelligence and the role of psychosocial factors in developing giftedness. These findings provided information about Korean teachers' orientations toward the traditional or contemporary approach related to developing giftedness. Part 5_2 and Part 7_7 provided the researcher with information regarding what perceptions Korean teachers had about development of giftedness in talent domains. This part asked what perceptions they held concerning developing giftedness in academic and nonacademic domains across the life span.

Also, Part 5_1, Part 6 and Part 7 investigated to what degree Korean teachers supported the accommodation of teaching practices for talent development in academic domains (e.g., grouping practices and/ or enrichment activities) and nonacademic domains (e.g., out-of-school programs and/or after-school programs) respectively. These Korean teachers' perceptions about whether accommodation should be made for students' talent development were intended to provide answers to the second research question. Finally, Part 8 asked how much Korean elementary teachers supported the implementation of diverse gifted services in academic and nonacademic domains. The degree of support for the accommodation of such gifted services was meant to provide answers to the second research question.

In summary, the gifted child approach and the talent development approach address different definitions of giftedness. Parts 3-4 as well as Part 5_2 and Part 7_7_ showed whether Korean teachers' views related to giftedness leaned more toward one of these two approaches, which provided answers concerning the first research question. In addition, Parts 6-8 including Part 5_1 addressed the second research question by investigating the Korean teachers' accommodation of teaching practices and gifted services.

The questionnaire developed for this study was designed to measure mental characteristics such as attitudes, perceptions and values. This is a self-report measure in which the test-taker answers a series of questions. A paper-and-pencil questionnaire was used to collect data in this study. Although an online survey is easier to manage, the response rate tends to be low compared with the response rate of a paper questionnaire (Nulty, 2008). The questionnaire uses a Likert scale to assess what an individual perceives about situations. A Likert-scale requires a participant to respond to a series of statements by indicating the strength of his or her agreement. This survey implemented a 5-point scale, from *strongly disagree* (SD), *disagree* (D), *somewhat agree* (SWA), *agree* (A), to *strongly agree* (SA) (Gay, Mills, & Airasian, 2009). Each response was allocated a point value (e.g., SD=1, D=2, SWA=3, A=4, SA=5) and an individual's score was calculated by adding the point values of the questions answered. In this study, a higher total score in the construct of TCGiftedness would indicate a more favorable attitude or perception towards the contemporary approach (a talent development approach). Also, a higher total score in the construct of TDS would show higher support for making accommodations in teaching practices for students' talent development.

Regarding measurement scales, researchers usually use four types: nominal, ordinal, interval, and ratio scales. A measurement scale is defined as a system to organize data so that it may be analyzed and interpreted accurately. Thus, it is critical to know which type of scale was used in the collected data because different scales require different statistical analyses (Gall, Gall, & Borg, 2007; Gay et al., 2009). In this study, nominal and interval scales were used. A nominal scale measures categorical data (e.g., female vs. male). Also, continuous scores, defined as "a score that can take on an infinite set of scores between the limits of the score" (Gay et al., 2009, p. 544), are treated as interval variables on most tests used in educational research, such as achievement, motivation and attitude tests. Because the results in this questionnaire were indicated as continuous scores, interval variables were used (Gall et al., 2007; Gay et al., 2009).

Translation

Although the original questionnaire was written in English, study participants were Korean teachers. Thus, the questionnaire was translated into Korean. The MMCCADC (2007) suggested that a well-translated survey instrument should be equipped with semantic equivalence across languages, conceptual equivalence across cultures, and normative equivalence across societal norms as compared with the source survey. The MMCCADC (2007) defines semantic equivalence as the words and sentence structures in the translated text having the same meaning as those in the source language. Conceptual equivalence means that the concept being measured is the same across versions, although wording in explaining the concept may show differences. With normative equivalence, the translated text addresses societal norms that may be different across cultures.

To meet these three equivalences, first, the researcher translated the English version of the questionnaire into the Korean version. Beaton, Bombardier, Guillemin, and Ferraz (1998) recommended that a person blind to the original survey should translate the new survey (the Korean version) back into the source language (the English version). Then, the researcher should compare the back-translated survey version with the original survey to check the validity of the translation. Thus, the researcher asked a bilingual Korean undergraduate student who attended the College of William and Mary at the time of the study to translate from the Korean version newly translated by the researcher back into English. Then, the dissertation committee compared the back-translated survey with the original English version. The purpose of this step was to check whether a general teacher who was unfamiliar with gifted education, like the student translating the survey, could understand the semantic, conceptual, and normative equivalence as the researcher intended.

The next step involved contact with an expert working in the field of Korean gifted education to investigate whether the translation was accurate. The researcher attempted to get advice regarding the accuracy of the translation in academic terms. As a result, the expert suggested that some words or terms that she thought that Korean teachers could not understand clearly should be revised. Behling and Law (2000) maintain that it is much harder to achieve three types of equivalence when translating a survey that asks questions about attitudes and opinions because the ideas are more abstract and the concept may not be relevant throughout the society. Also, they argue that differences in culture (i.e., the resistance to discussion of certain beliefs with strangers) can have an influence on achieving the three types of equivalence. Thus, in this study, conducting a pilot study was an important step.

A pilot test was conducted in Korea to determine whether participants correctly understood the questionnaire in terms of the three types of equivalence. Participants in the pilot study were nine elementary teachers, working in one elementary school, who were introduced to me by an administrator working in the Seoul Metropolitan Office of Education. Due to the school's schedule, fifth and sixth grade homeroom teachers participated in this pilot study. For the pilot study, each participant took approximately

40-45 minutes to complete the survey. These participants were asked to give feedback to the researcher as to whether they could understand the terminology and concepts due to the differences in language, culture, and societal norms. In addition, they were asked to write any comments and suggestions that could be helpful to the survey implementation. In summary, most participants indicated the following points. First, they pointed out that there were too many pages, divided sections, and questions in the survey (12 pages). Second, as a result of the translation from the original English version into Korean, some expressions used in the survey were awkward. Finally, although sentences in the survey that were translated into Korean made sense, some sentences could be clearer by changing the expressions used or by rearranging the words.

These points that participants indicated in the pilot study were very informative and beneficial. First, because a Korean survey commonly has five to six pages at the most, reflecting the Korean culture's pressing work schedule, the long survey could increase the possibility that potential participants might not fill it out. Recognizing such cultural tendencies in advance and revising the survey could contribute to a higher response rate. Second, by adjusting the survey's expressions to Korean language, culture and social norms, the researcher could obtain more valid responses regarding research questions.

To solve problems and concerns indicated through this pilot study, the researcher took the following measures. First, by combining questions that could be merged, the researcher tried to decrease the number of questions within one section. Also, the items with repetitious tendencies were eliminated with the permission and assistance of committee members. The committee members reviewed the items to ascertain that the shortened survey could answer the two research questions. Thus, the researcher investigated how many items were required to answer each research question. After obtaining one committee member's permission based on investigated results, the shortened survey was finalized. Second, to avoid the impression that the survey was too long and too much of a burden, the researcher decided to print the survey on both sides of the paper, which decreased the page number by half. Finally, the researcher revised ambiguous or confusing items before the final survey was administrated. In particular, a Korean expert in gifted education helped to make the meaning more clear and the translation better conform to the Korean language.

Validity and Reliability

The validity and reliability of this questionnaire were ensured in several ways. First, two of the dissertation committee members were experts in gifted education and had experience in constructing surveys in that field. Their assistance with the development of the instrument enhanced the construct validity. Also, face validity, the degree to which a test or a questionnaire seems to measure what it claims to assess, was carefully considered through the following process. Opinions were obtained from both committee members who worked together to construct the survey and an expert in Korean gifted education who participated in the translation of the survey. Then, content validity was considered (Gay et al., 2009). Most of all, the researcher checked whether each question accurately reflected the two constructs of TCGiftedness and TDS. The table attached in Appendix E indicates how each item in the questionnaire addressed each research question and how the items were grounded in the literature.

To accurately assess the constructs of TCGiftedness and TDS, each question in the survey was carefully constructed. Some items from Schroth and Helfer's (2009) survey, which investigated educators' conceptions of academic talent and giftedness and was reviewed for construct validity by a panel of gifted education experts, including three past presidents of the NAGC, were modified for the present study with permission from the authors (personal communication, April, 12, 2014). Table 1 and Table 2 show which survey items represent TCGiftedness and TDS.

Table 1

The Survey Items Related to TCGiftedness

Survey Number	**The Survey Items Indicating TCGiftedness**
Part 3_1	Gifted students have standardized test scores at the 98th percentile or above in all subjects.
Part 3_2	Gifted students have high IQ (at least IQ 130).
Part 3_3	Gifted students show excellent performance only in one domain.
Part 3_4	Gifted students show high capabilities in verbal/linguistic intelligence.
Part 3_5	Gifted students show high capabilities in logical/mathe matic intelligence.
Part 3_6	Gifted students show high capabilities in spatial intelli gence (e.g., manipulating three-dimensional configurations).
Part 3_7	Gifted students show leadership ability or potential.
Part 3_8	Gifted students show ability or potential in theatre/drama.
Part 4_1	You have a certain amount of intelligence, and you really *can't* do much to change it.
Part 4_2	Your intelligence is something about you that you *can't* change very much.
Part 4_3	You can learn new things, but you *cannot* really change your basic intelligence.

Table 1

The Survey Items Related to TCGiftedness

Part 4_4	Creativity can be developed through training.
Part 4_6	Gifted students show high achievement due more to high motivation than high IQ.
Part 4_8	Success in a professional field is due more to psychosocial factors (i.e., perseverance) than innate abilities.
Part 5_2	It is better for gifted students to specialize in one domain as early as possible (i.e., kindergarten) and focus their learning and practices on the specialized domain.
Part 7_7	When teachers first find gifted students' talents in nonacademic domains, it is more important for them to help students become enjoyably involved in activities of each domain than to focus on developing their skills in those domains.

Table 2

The Survey Item Related to TDS

Survey Number	The Survey Items Indicating TDS
Part 5_1	Schools should start the formal identification process to identify gifted students' talents as early as possible.
Part 6_1	Teachers should eliminate curricular material that students have already mastered.
Part 6_2	Teachers should assign gifted students enrichment work (i.e., projects in interest areas) during class.
Part 6_3	Teachers should use teaching strategies to elicit gifted students' high-level thinking.
Part 6_4	Teachers should assign homework differently based on

Table 2

The Survey Item Related to TDS

	each student's ability.
Part 6_5	Teachers should include lessons to develop gifted students' creativity within the regular curriculum.
Part 6_6	Because it is difficult to teach gifted students appropriately in the regular classroom, schools should implement pull-out programs. * Pull-out programs (gifted students go to a different classroom prepared to have enrichment activities for 2-3 hours once or twice per week).
Part 7_1	Systematic programs for gifted students' talent development in nonacademic domains should be implemented during regular school hours.
Part 7_2	Schools should increase the frequency of participation in after-school programs to provide gifted students with daily challenge in their nonacademic talent areas.
Part 7_3	Schools should provide free programs for all students to offer opportunities to develop gifted students' talent development in nonacademic domains.
Part 7_4	Out-of-school gifted programs (e.g., music gifted centers funded by government) should be employed to nurture gifted students' nonacademic talents.
Part 8_1	Grouping of students by ability level in the class
Part 8_2	Grouping of students by interest with an expert or an expert teacher in the area in the regular class.
Part 8_3	Pull-out programs (e.g., The use of more diverse teaching methods and learning materials for gifted students)
Part 8_4	After-school programs to nurture talent in more diverse domains (e.g., leadership/language/ dance)
Part 8_5	The implementation of after-school programs by out-of-school professionals (e.g., music instructor or tennis coach) to develop talents in nonacademic domains systematically
Part 8_6	Mentorship with professionals in academic/nonacademic domains
Part 8_7	Field trips for exposure to professionals in

Table 2

The Survey Item Related to TDS

	academic/nonacademic domains (e.g., scientist or ballet choreographer)
Part 8_8	Special schools for talent development of each academic/nonacademic domain (i.e., science magnet school/Art school)
Part 8_9	Online learning (i.e., taking gifted courses provided in foreign universities)
Part 8_10	Creativity training programs (i.e., experiencing programs to develop creativity)
Part 8_11	Training programs for the development of psychosocial skills (i.e., motivation)
Part 8_12	The presentation of talents through performance and products before an outside-of-school audience (e.g., community members, parents)
Part 8_13	Participation in competition in talent domains (e.g., science/ music)

Regarding reliability, the SPSS statistical program (Version 21, 2014) was used to calculate Cronbach's alpha as a reliability indicator of this survey (Gay et al., 2009). Cronbach's alpha estimates internal consistency reliability by determining how items in a questionnaire or test are related to all other test or questionnaire items and to the total test. This internal consistency indicates whether all of the items are measuring similar things (Gay et al., 2009). Firstly, when calculating the reliability of items indicating the construct of TCGiftedness through SPSS, the researcher obtained Cronbach's alpha reliability of 0.67 in TCGiftedness. This reliability of TCGiftedness was relatively low. The general convention in research recommends that one should make efforts to obtain reliability values of .70 or higher (Nunnally & Bernstein, 1994). Thus, because two items might cause a little concern in interpretation and SPSS indicated that it was possible to obtain higher Cronbach's alpha if two items were deleted, it was decided to eliminate two items. Cronbach's alpha reliability of 0.70 in TCGiftedness was obtained. In TDS, Cronbach's alpha reliability of 0.91 was obtained.

Participants

Korean elementary teachers (*N*=879) who work in the 28 public schools of Seoul, the capital city of South Korea, took part in this study. The Korean elementary school system is composed of first grade to sixth grade. In the system, a homeroom teacher instructs multiple subjects, taking on one classroom. However, some schools allocate teachers for specific subjects. A subject teacher is a person who teaches one specific subject (i.e., music) in various grades, not being responsible for one classroom. The subject teachers as well as homeroom teachers participated in this study because they instruct students, although they are not assigned a homeroom. As described in Chapter 1, most gifted programs are implemented in the elementary schools in Korea. Because elementary teachers could provide trustworthy empirical data, they comprised the sample of this research. To represent a population of 30,000 elementary teachers in Seoul public schools, the required sample size was 381 valid surveys (Krejcie & Morgan, 1970). Surveys were sent to 28 schools that were selected to participate in this study. At first, 879 surveys were collected. However, surveys with some problems (i.e., surveys with many missing items) were eliminated because such surveys did not provide valid information. As a result, 836 valid surveys were left. However, because two surveys with outliers were eliminated as the following chapter explains in more detail, 834 valid surveys were ultimately used in data analysis. Thus, there were much more than 381 valid surveys collected, enough to represent the perceptions of the population. Table 3 shows the demographics of participants in this survey.

Table 3

Demographic Information about the Survey Participants

Category		*n*	%
Gender			
	Male	95	11.4
	Female	738	88.5
	Missing	1	0.1
	Total	834	100.0
Age			
	20-30	168	20.1
	31-40	249	29.9
	41-50	229	27.5
	51-60	169	20.3
	61+	19	2.3
	Total	834	100.0
Grade			
	First Grade	128	15.3
	Second Grade	109	13.1
	Third Grade	115	13.8
	Fourth grade	122	14..6

Table 3

Demographic Information about the Survey Participants

	Fifth Grade	149	17.9
	Sixth Grade	149	17.9
	Other	58	7.0
	Missing	4	0.5
	Total	834	100.0
Years of teaching Experience			
	1-3	101	12.1
	4-8	150	18.0
	9-12	96	11.5
	13+	486	58.3
	Missing	1	1
	Total	834	100.0
Degree			
	Bachelor's	550	67.1
	Master's	259	31.1
	Doctorate	6	0.7
	Other	9	1.1
	Total	834	100.0
Professional Development			
	Yes	197	23.6
	No	636	76.3
	Missing	1	0.1
	Total	834	100.0
School			

Table 3

Demographic Information about the Survey Participants

Identification			
	Yes	607	72.8
	No	31	3.7
	I do not know	196	23.5
	Total	834	100.0
School Programs for the Gifted			
	Yes	405	48.6
	No	135	16.2
	I do not know	273	32.7
	Missing	21	2.5
	Total	834	100.0

Procedure

To answer the questions presented in the previous section, it was necessary to create a research protocol to guide this study, including data collection. This study focused on collecting data in Seoul. Seoul is the most populous city in South Korea and there are an estimated 30,000 elementary teachers in the public schools. As it was not possible to investigate the perceptions of all elementary teachers as a population, 900-1,000 participants as a representative sample were selected and oversampled because unpredictable situations might decrease the response rate.

In this study, a random sample was used. In Seoul, there are 11 district offices of education. To recruit participants for this study, a Korean administrator in the Seoul Metropolitan Office of Education, who was responsible for gifted education in the Seoul public schools, was contacted through a phone call. The researcher explained the overview and purpose of this study. The administrator was supportive of this study.

She explained that, because there were 11 district offices of education in Seoul, she wanted to select two to three elementary schools in each district office of education. However, the administrator suggested a compromise plan, saying that it was not easy to randomly select elementary schools in each district office of education. He suggested that the researcher first select five elementary schools randomly among schools included in each district office of education. The official contended that because some schools among the five schools selected in each district office of education could not participate in this study due to the other scheduling or school's situations, the researcher should select more than two to three schools in each district office of education.

Thus, the researcher randomly selected five schools from the list of schools in each district office of education by using a random number generator. Then, she sent the list of five elementary schools selected in each district to the administrators in the Seoul Metropolitan Office of Education. The administrator asked their colleagues in each district office of education to contact school administrators, such as the vice principal in each school, to ask if the randomly selected five schools could participate in this study voluntarily. As a result, one to four schools in each of the nine district offices of education agreed to participate in this study before the researcher personally visited the schools. However, administrators of two districts (South and Kangnam district office of education) did not obtain agreement beforehand from the selected five schools. They said that the researcher could visit two to three schools in the list to ask whether the school could possibly participate in this study. The administrator in Seoul Metropolitan Office of Education informed the researcher of these results. See Appendix F for the list of elementary schools selected in each district office of education of Seoul.

After getting the list of the selected schools, the researcher personally contacted a vice principal in each school through a telephone call and explained the study in more detail. As a result, two schools that initially gave agreement later decided not to participate in this study. In addition, in the cases of six schools that did not give agreement beforehand, the researcher visited schools directly and explained this study in great detail, showing the survey (Appendix D) and consent form (Appendix A). Consequently, she received permission from five out of the six schools recommended. A total of 28 schools ultimately participated, representing all of the 11 districts in Seoul.

In the selected elementary schools, all teachers in each grade were invited to voluntarily participate in this research. Consequently, the number of teachers who participated in this study differed according to each school. See Appendix F for the number of teachers who participated in this study in each of the 28 schools. Participants were required to meet the following criteria: a participant must be an elementary teacher who works in the public schools selected in Seoul, and he/she should be a homeroom or a subject teacher.

Finally, after deciding which schools to include in the study, she visited these schools, which were dispersed across Seoul and directly delivered surveys. At first, the delivery of survey by mail was recommended. However, to enhance response rate, she chose to contact an administrator in each school directly and explain the study in more detail. This helped to raise fidelity in the process of the study, because she could clearly explain the research process and clarify confusing points. Also, she provided administrators with detailed instruction sheets (Appendix B) in order for them to conduct the survey as originally planned.

In addition, because the researcher was concerned that the response rate might be lower than expected, a professor working in the field of Korean gifted education introduced the researcher to three elementary teachers that worked in three elementary schools included in the two districts (South and Kangnam district office of education) that did not agree to this study in advance. These teachers were also the professor's graduate students. The researcher personally contacted those teachers and visited those schools. She followed the same procedures (e.g., survey delivery and the explanation of procedures) as the previous section explains.

Given the importance of obtaining a high response rate in survey research so as not to skew the data, which make it difficult for the researcher to draw accurate conclusions based on the limited sample (Gay, Mills, and Airasian, 2009). The researcher took extra measures to garner a high response rate by personally delivering the surveys and explaining the process to the administrator as noted above. Gay et al. (2009) suggest that a low response rate, for example, under 50%-70%, poses concerns about the generalizability of results, because a researcher does not know how well the respondents represent the population from which the sample was selected. Thus, this study employed a paper-and pencil questionnaire to help achieve a higher response rate.

To successfully collect data, the preliminary process of survey design and distribution was critical. For example, through a pilot test, the researcher checked how long it would take to complete the questionnaire, and asked the administrator to allow adequate time for participants to complete the questionnaire. The researcher tried to manage the administration of the survey in the field when possible because the researcher's presence in the field would enhance the fidelity of the data-collection process. If she were monitoring and checking the process and time, there would be a greater likelihood that the administrators and participants would follow the predetermined procedure. However, in the real data-collection process, because 28 schools participated in this study, it was not possible for the researcher to manage the implementation of the survey in all 28 schools. If the researcher monitored only some of the 28 schools, it would not be desirable in terms of the standardization of the research procedure. Thus, she selected an alternative process to raise the fidelity of the data-collection process. Fidelity was enhanced by an instruction sheet, which explained the procedures to administrators in advance.

The surveys were administered to 1,480 elementary teachers from the 28 selected schools. The schedule for the surveys to be returned differed according to each school. Also, the return methods differed because two schools returned the surveys by mail, and the remaining 26 schools' surveys were picked up by the researcher. A total of 879 surveys were returned to the researcher for a response rate of 59.4%. Such a response rate can be regarded as good, considering the survey was given at the end of the semester, which is the busiest period in the school.

Data Analysis

This study sought to answer two research questions. The first research question related to giftedness was answered by determining whether Korean teachers' perceptions lean more toward the concept of giftedness from the traditional approach or the talent development approach. The answer to the second research question about teaching gifted students was determined through teachers' responses to the survey items regarding how strongly they agreed with accommodating their teaching practices for gifted students' talent development.

To obtain answers to the research questions, firstly, it was important to get an overall picture of a full sample because the research questions investigated the perceptions of Korean elementary teachers in this study of giftedness and support for talent development. Thus, to obtain data about demographic information of all participants as well as information about schools where they worked, descriptive statistics were used. Using SPSS statistical program, the researcher investigated frequencies and percentages of teachers who responded to each question related to the demographic and school information. Also, based on this basic information about the full sample, the mean scores of TCGiftedness and TDS of the full sample were calculated to investigate overall perceptions of all participants related to TCGiftedness and TDS.

As the next step, the mean scores in TCGiftedness and TDS of the diverse demographic groups were used to compare their perceptions about a traditional (a gifted child approach) versus a contemporary (a talent development approach) conception of giftedness, and their support for accommodating practices for gifted students' talent development. These demographic groups were formed based on the following four variables: (a) the grade a teacher instructs, (b) years of teaching experience, (c) a teacher's experience participating in professional development related to gifted education, and (d) the presence of gifted programs in their schools.

First, to compare how the demographic groups' perceptions differed according to teaching levels, elementary teachers were divided into two groups, lower (grades 1–3) and upper (grades 4–6) grades. Then, by comparing mean scores of the two groups through *t*-test based on the categorical independent variable of grade and the dependent variable of scores in the subscale of the talent development orientation, this analysis investigated the general tendency of teachers' talent development orientation (the dependent variable of the research question 1) by grade level.

The t-test is a parametric test of significance employed to test for a difference between two means at a selected probability level (Gall et al., 2007). Thus, because the degree of teachers' talent development orientation was indicated by continuous scores, the means of two groups could be compared through a parametric test of t-test if the assumption of normality in data was met. In this study, .05 was used as α level, the significance level stated as a probability (Kiess & Green, 2010). The α level offered the criterion in deciding whether the difference in mean scores among groups is significant or not in a statistical test (Kiess & Green, 2010).

Regarding the years of teaching experience, four groups were formed: 1-3 years, 4-8 years, 9-12 years, and over 13 years. In this analysis, there was one independent variable, composed of four levels, and one dependent variable of the talent development approach orientation. Because the mean scores of these four groups were compared, one factor between-subjects (one-way) Analysis of Variance (ANOVA) was appropriate due to the following reason: as the number of groups increased, multiple t-tests could be used, but it could increase Type I error due to the increase of α. That is, when multiple significance tests were conducted although the significance level for a given t-test was α, the significance level increased dramatically as the number of tests increased. Thus, to control overall Type I error rate when multiple tests are performed simultaneously, the criterion for each test should be more stringent. For example, to obtain the 0.05 as α level when ten tests are conducted, more stringent alpha of .005=0.05/10 for each test should be used to keep an overall alpha which does not exceed 0.05 (Field, 2009). Thus, if more than two independent groups are compared, ANOVA, with greater control of Type I errors, is more appropriate (Field, 2009).

In particular, there can be concern that because the sample sizes of groups with different years of teaching experience were very unequal, the question can be posed as to whether using an ANOVA is acceptable. According to Grace-Martin (2014), the only practical issue related to using a one-way ANOVA with unequal sample sizes is that very unequal sample sizes can influence the homogeneity of variance assumption. However, he explains that ANOVA is considered robust regarding moderate departures from this assumption. Moreover, when calculating the Revene test to check the homogeneity of variance in the variable of years of teaching experience, SPSS indicated that the results were not significant, so the homogeneity of variance is assumed. Thus, the unequal size among groups in this study does not produce any practical concern.

When these four levels of an independent variable were compared and a statistically significant F value was produced, a multiple comparison test was required to follow up the analysis of variance (Kiess & Green, 2010). The Tukey test as a post hoc test among all possible pairwise comparison was used to find whether means among teaching experience groups differed significantly. In particular, the Tukey test holds the probability of a Type I error equal to or less than α for multiple pairwise comparisons. This comparison identified how teachers' perceptions were different according to years of teaching experience related to a traditional (gifted child) or a contemporary (talent development) approach regarding giftedness.

A third analysis examined differences between teachers who have or have not had experience in professional development in gifted education. When investigating whether the difference in mean scores between the participants and nonparticipants was statistically significant, the t-test was used because there was one independent variable composed of two levels and one dependent variable (the talent development approach orientation). This study found whether teachers' perceptions related to giftedness in terms of the talent development orientation were different according to participation in professional development. In this analysis, the same issue can be posed in conducting a *t*-test among groups with unequal sample sizes. However, due to the same reason described in the previous section (e.g., the robust *t*-test and the homogeneity of variance), the unequal sample size between two groups does not create any practical concern (Grace-Martin, 2014).

Three contrasting groups were formed based on teachers' knowledge of the presence of gifted programs in their schools (Yes. vs. No vs. I do not know). The ANOVA was used for the same reasons presented in the previous analysis. This study attempted to find whether teachers' perceptions regarding giftedness were significantly different according to the implementation of gifted programs in their schools. These analyses were repeated for the remaining research question 2. To answer the research question 2, diverse groups formed according to the previous four independent variables were compared in terms of the support for the accommodation of practices and gifted services for gifted students' talent development. See Table 4 for an outline of data analysis.

Finally, to investigate the overall trends of participants' common perceptions in individual survey items comprising TCGiftedness and TDS, two approaches were used. First, the mean scores of the full sample in individual items were displayed according to the ranking order in a graph and their overall trends were investigated. Also, individual items were grouped according to thematic categories. The common trends of participants' perceptions in individual items included in each thematic group were explored.

At the end of the survey, there were two additional open-ended questions asking (1) Korean elementary teachers' thoughts regarding the goal of Korean gifted education and (2) their opinions on Korean gifted education as a whole. As a method of analyzing these responses, the researcher referred to the analysis method used in qualitative research. Among the data from Question 1 and Question 2, attempts were made to find common themes. Putting together similar comments, one theme representing a meaningful subject was elicited.

Table 4

Outline of Data Analysis

Research Question	**Data Sources**	**Data Analysis**
Research Question 1:	**Survey Items:**	
1.How are the perceptions of Korean elementary teachers of different grades groups about giftedness related to gifted students' talent development different in mean scores indicating the talent development orientation?	The talent development orientation related to giftedness	1.Grades (1- 3 vs. 4 – 6): *t*-test

Table 4

Outline of Data Analysis

2.How the perceptions of Korean elementary teachers with different years of teaching about giftedness related to gifted students' talent development are different in mean scores indicating the talent development orientation?	2. Years of Teaching Experience (1-3; 4-8; 9-12; over 13): One-Way ANOVA and Post hoc test (Tukey test)
3.How the perceptions of Korean elementary teachers with or without professional development about giftedness related to gifted students' talent development are different in mean scores indicating the talent development orientation?	3.Participation in Professional Development in Gifted Education (Yes vs. No): *t*-test
4. How the perceptions of Korean elementary teachers with or without gifted programs in the	4.Implementation of gifted programs in the schools (Yes vs. No vs. I do not know): One-Way

Table 4

Outline of Data Analysis

schools about giftedness related to gifted students' talent development are different in mean scores indicating the talent development orientation?		ANOVA and Post hoc test (Tukey test)
Research Question 2:	**Survey Items:**	
1.How are the perceptions of Korean elementary teachers of different grades about teaching gifted students related to gifted students' talent development are different in mean scores indicating the support for talent development	The support for talent development	1.Grades (1- 3 vs. 4 – 6): *t*-test
2.How the perceptions of Korean elementary teachers with different years of teaching about teaching gifted students		2.Years of Teaching Experience (1-3; 4-8; 9-12; over 13): One-Way ANOVA and Post hoc test (Tukey test)

Table 4

Outline of Data Analysis

related to gifted students' talent development are different in mean scores indicating the support for talent development	
3.How the perceptions of Korean elementary teachers with or without professional development about teaching gifted students related to gifted students' talent development are different in mean scores indicating the support for talent development	3.Participation in Professional Development in Gifted Education (Yes vs. No): *t*-test
4.How the perceptions of Korean elementary teachers with or without gifted programs in the schools about teaching gifted students related to gifted students' talent development are different	4.The implementation of gifted programs in the schools (Yes vs. No vs. I do not know): One-Way ANOVA and Post hoc test (Tukey test)

Table 4

Outline of Data Analysis

in mean scores indicating the support for talent development

Ethical Consideration

In conducting this study, the researcher ensured the following important ethical issues: first, she kept confidentiality of the data collected. Also, she informed teachers of the following: (a) their participation was completely voluntary; (b) they might decline to participate or they might withdraw at any time; (c) They might also refuse to answer any question on the written response and request that data collected from them should not be used; and (d) none of these would incur a penalty of any sort, and would not jeopardize their jobs. All participants received an informed consent document informing them of the particulars of the study and their rights as a participant.

In particular, there was a cultural difference in the process of collecting an informed consent document. Because participants should indicate consent twice in both an informed consent sheet and on the survey, it was a unique process to Korean teachers. In Korea, because filling out a survey implies that the participant agrees to participate in the study and allows the researcher to use the data, a participant usually does not fill out an additional informed consent document. Thus, although the researcher explained the reason in detail, giving consent twice through both an informed consent sheet and the survey caused a little confusion. As a result, some participants gave consent in both a consent form and a survey, some participants gave consent in the survey only, and other participants provided consent on the consent form only. As a result, it was necessary to decide how to deal with this data. Considering the cultural differences, the committee decided that the surveys completed were valid and consented for use in the study.

Before collecting data, the research was approved by the College of William and Mary institutional review board (IRB). Once the data were collected, the researcher ensured that no one else had access to the data and any data collected from participants were held in confidence (Fraenkel & Wallen, 2006).

CHAPTER 4

RESULTS

In the results sections, first of all, the general information regarding a full sample will be addressed. Then, the researcher will present an overall picture of the results for TCGiftedness and TDS of the full sample and will describe the comparison of perceptions among demographic groups formed according to: (a) teaching levels; (b) years of teaching experience; (c) participation in professional development; and (d) implementation of gifted programs in the schools. In addition, participants' common perceptions in individual items comprising TCGiftedness and TDS in terms of ranking order and thematic categories will be presented.

The Description of the Full Sample

First of all, through Part 1 of the survey, demographic information about participants in this study was collected (Table 3). Regarding gender, the proportion of female teachers (88.5%) was higher than that of male teachers (11.4%). In relation to age, the proportion of respondents among age range (20-30; 31-40; 41-50; 51-60) was similar (20.1%-29.9%), but the proportion of the group over 61 years old (2.3%) was very low. Regarding grade, the composition of each grade was similar (13.1%-17.9%) and the subject teachers comprised 7.0% of the sample. However, concerning years of teaching experience, teachers with over 13 years comprised 58.3%, which was a higher proportion than other groups (1-3; 4-8; 9-12). Most teachers had Bachelor's degrees (67.1%) although there were teachers with other degrees such as Master's (31.1%) and Doctorate (0.7%). In professional development, whereas the group (N=197) with experience in professional development comprised

23.6% of the total participants, the group (N=636) without experience in professional development made up 76.3% of the total number. Demographic information about professional development explains this further. Only 9.4% of respondents had taken part in a professional development program introducing the concept of giftedness. Also, 83.7% of participants had never attended gifted education workshops for teachers. The rate of participation in non-degree college courses and educational degrees in gifted education was even lower. Only 3.2% and 1.1% of participants have had such experiences respectively. Some respondents used other methods such as long- distance learning, but this comprised only 1.8%.

Second, through Part 2 of the survey, school information was obtained. In relation to the use of identification system by their schools, a majority of teachers (72.8%) responded that their schools use an identification system. However, 23.5% of teachers did not know about the presence of the identification system. Regarding the question asking which methods their schools use to identify gifted students, 98.3% of teachers responded that their schools did not use IQ test as an identification method. On the contrary, 71.6% of teachers responded that creativity tests were not used as an identification method. Their schools used teacher observation (57%) and recommendation (41.1%) as identification methods. However, a majority of teachers responded that grade (87.3%) and other identification methods such as interviewing (93.2%) were rarely used as an identification method. Only 3.2% of teachers checked in the column that there is no knowledge regarding which identification methods were used. In school programs for the gifted, 48.6% of teachers responded that their schools have gifted programs. However, the percentage of participants (32.7%) responding that they do not know about the information was higher than that of participants (16.2%) answering that there are no gifted programs in their schools.

Finally, there are survey items that are not included in the two constructs of TCGiftedness and TDS but can provide the researcher with important information in understanding Korean elementary teachers' perceptions related to gifted students' talent development. Firstly, concerning the statement that gifted students are a valuable resource in society (P4_5), a majority of teachers (81.7%) agreed or strongly agreed with the statement. Only 2.0% of teachers disagreed or strongly disagreed with the statement. Also, a majority of teachers (79.7%) perceived that gifted students show high task commitment due to intrinsic motivation, such as enjoyment of learning, rather than extrinsic motivation, such as teachers' praise (P4_7). Few teachers (4.5%) disagreed or strongly disagreed with the statement. Regarding whether the out-of-school gifted programs are superior to within-school gifted programs, a majority of teachers (61.5%) to some degree agreed with the statement. A majority of teachers (90.0%) agreed at varying degrees that school teachers have limited knowledge and skills in nonacademic talents. Particularly, quite a few teachers (around 30.0%) indicated some agreement with these two questions (P7_5 & P7_6).

Data Preparation

Missing data in non-demographic variables was replaced by the series mean for each variable (Gall et al., 2007). Seventeen out of 55,878 variables were missing. This was a very low rate, which corresponded to 0.03% of all the variables. Some respondents (Item6:1 respondent; Item 7: 8 respondents) provided answers to Part 1, Items 6, "If yes, what kind of professional development have you attended related to gifted education?" after checking "No" or "I do not know" to the item "Have you participated in professional development for teachers related to gifted education?" Eight respondents did the same for Part 1, Item 8, "If yes, which of the following methods does your school use to identify gifted students?" after checking "No" or "I do not know" to the question, "Does your school use any system to identify gifted students?" Because this was not a big mistake and participants provided valuable information in other responses, these surveys were accepted and used in statistical analysis.

Before conducting diverse analysis such as the *t*-test or ANOVA, the normality and outliers were evaluated to identify whether TCGiftedness (traditional/contemporary giftedness) and TDS (talent development support) data met the assumptions of *t*-test or ANOVA. The normality was checked through skewness and kurtosis, but the normality assumptions were not a major concern in this study because the data set was large (Field, 2012). Thus, despite some indicators showing significant skewness and kurtosis (TCGiftedness: Skewness [-.501]/ Std. Error of Skewness [.085] & Kurtosis [1.394]/ Std. Error of Kurtosis [0.169]; TDS: Skewness [.213]/ Std. Error of Skewness [.085]), based on the criteria of skewness and kurtosis being larger than 2 times the standard error of skewness and kurtosis, continuous analysis could be conducted. Upon examination of a boxplot, two outliers were removed because outliers that are very different from the rest of the data can bias a parameter such as the mean (Field, 2012). This brought the total number of cases in the final sample to 834.

Additionally, the following six items required reverse recoding:

"Gifted students have standardized test scores at the 98thpercentile or above in all subjects" (P3_1).

"Gifted students have high IQ (at least IQ 130)" (P3_2).

"You have a certain amount of intelligence, and you really *can't* do much to change it" (P4_1).

"Your intelligence is something about you that you *can't* change very much" (P4_2). "You can learn new things, but you *can*not really change your basic intelligence"

(P4_3).

"It is better for gifted students to specialize in one domain as early as possible (i.e., kindergarten) and focus their learning and practices on the specialized domain"

(P5_2).

A higher score in non-reverse coded items indicates a respondent's contemporary perception of giftedness, whereas a higher score of this reverse-coded item indicates a respondent's traditional perception._Survey items in Appendix G and H are represented in their original form, prior to reverse coding. As explained in Chapter 3, the Cronbach's alpha reliability of 0.70 in TCGiftedness and 0.91 in TDS were obtained.

Research Question One

What are the perceptions of Korean elementary teachers about giftedness in terms of talent development?

To answer this research question, the study was designed to investigate whether Korean teachers' perceptions lean more toward the concept of giftedness from the traditional gifted child approach or the contemporary talent development approach. To investigate the orientation of Korean elementary teachers' perceptions about giftedness, the construct of TCGiftedness was created. Firstly, the mean score in TCGiftedness of the full sample was explored. This score provided information about the full sample's perceptions about TCGiftedness in relation to talent development. Secondly, to investigate Korean elementary teachers' perceptions about giftedness in more detail, the TCGiftedness means of diverse demographic groups based on the previous four variables were explored and compared. Through these comparisons, their different perceptions related to TCGiftedness were investigated. Table 5 shows the results from the comparison of corresponding demographic groups. Finally, the trends of scores in individual items comprising TCGiftedness were explored using two approaches (Figure 1-2). Through overall ranking trends of mean scores of individual items, participants' common perceptions about TCGiftedness were investigated. In addition, individual items were grouped based on thematic categories, and participants' common perceptions about individual items within these categories were explored. Table 6 indicates the mean scores of both a full sample and diverse demographic groups for each survey item. The frequency and the percentage of responses to each survey item appear in Appendix G.

The Perceptions of the Full Sample Related to the Traditional and Contemporary Approaches Related to Giftedness

In analyzing data of a full sample, the score 3 was chosen as the mid-point, and scores over 3 were regarded as showing contemporary giftedness. On the contrary, scores under 3 were considered to demonstrate traditional giftedness. The mean score of the full sample in TCGiftedness was 3.56. This means that, overall, Korean elementary teachers in this study oriented more toward contemporary giftedness. However, because the score indicated that the orientation of their perceptions did not drastically incline toward the contemporary approach, it can be speculated that some aspects of their perceptions remained traditional.

The Different Perceptions of Korean Elementary Teachers Related to Traditional and Contemporary Giftedness

To investigate what different participants' perceptions are according to diverse demographic groups, the following demographic groups were formed. The following section presents the results.

The perceptions of lower and upper grades Korean elementary teachers related to the traditional and contemporary approaches. To identify differences in TCGiftedness between teachers from the upper (grade 4-6) and lower (grade 1-3) elementary grades, an independent sample *t*-test was used (Kiess & Green, 2010). With an alpha level of .05 and a two-tailed test, the mean score of upper grade teachers ($M = 3.59$, $SD = .38$; see Table 5) was significantly higher than the mean score ($M = 3.50$, $SD = .37$) of lower grade teachers, $t\ (770) = 3.10$, $p < .01$. Upper grade teachers leaned more toward the contemporary talent development approach in giftedness compared to lower grade teachers. Statistical significance assesses whether there is an effect, Effect Size (ES) assesses the magnitude of an effect. When calculating the ES of these two groups, an ES of 0.24 was obtained (Table 5). Because the ES is less than 0.45, the ES is interpreted as small effect (Lipsey, 1990).

The perceptions of Korean elementary teachers with different years of teaching experience related to the traditional and contemporary approaches.

Mean scores of the survey items related to TCGiftedness of teachers from the four groups with different years of teaching experience (1-3 vs. 4-8 vs. 9-12 vs. 13+) are displayed in Table 5. With alpha equal to .05, the one-way analysis of variance (ANOVA) indicated a significant difference in the mean scores of these groups. $F\ (3, 829) = 4.29$, $p < .01$. The $p < .01$ indicates that at least one difference among group means is statistically significant.

To identify which group means were different from one another, the Tukey post hoc test that holds the probability of a Type I error equal to or less than α for multiple pairwise comparisons was conducted. The results indicated that the mean score of the group with 1-3 years of teaching experience was significantly higher than the mean score of the group with over 13 years of teaching experience. The most experienced teachers leaned more toward the traditional perception of giftedness than the least experienced teachers. However, there was no significant difference in mean scores among other groups (e.g., 1-3 vs. 4-8 or 1-3 vs. 9-12; see Table 5). The ES between the group with 1-3 years of teaching experience and the group with over 13 years of teaching experience was 0.32. Thus, this ES is regarded as a small effect according to prevailing practice for interpreting ES (Lipsey, 1990).

The perceptions of Korean elementary teachers with or without professional development related to the traditional and contemporary approaches. The differences in teachers' perceptions according to their participation in professional development were investigated. To identify whether the difference (0.10) in mean scores of the two groups with or without professional development was statistically significant, independent samples *t*-test was employed (see Table 5). Consequently, Table 5 displays the outcome. With an alpha level of .05 and a two-tailed test, the mean score of the group with professional development ($M = 3.63$, $SD = .38$) was significantly higher than the mean score of the group without professional development ($M = 3.53$, $SD = .38$), $t\ (833) = 3.28$, $p < .01$. The group with professional development had a statistically significant orientation toward a contemporary view of giftedness than did the group without professional development. However, the ES was not big, only 0.26, which means that the practical significance was small (Gall, Gall, & Borg, 2007).

The perceptions of Korean elementary teachers with or without gifted programs in the school related to the traditional and contemporary approaches.

To determine whether the differences in mean scores among the three groups with, without, or without knowledge about gifted programs of their schools were statistically significant, one-way ANOVA was conducted (Table 5). With alpha equal to .05, the one-way ANOVA indicated a significant difference in mean scores of these groups. $F(2,810) = 13.06, p < .001$. The p value indicated that at least one difference between group means was statistically significant (Kiess & Green, 2010).

To identify which group means were different from one another among the means of three groups, the Tukey post hoc test was conducted. The mean score of the group with no knowledge about gifted programs in the school was significantly lower than the mean scores of the other two groups with or without gifted programs in the school. However, there was no significant difference between the mean scores of the group with gifted programs and the score of the group without gifted programs in the school (see Table 5). When calculating the ES between the group with gifted programs and the group with no knowledge about gifted programs, 0.37 was obtained. Also, the ES between the group without gifted programs and the group with no knowledge about gifted programs was 0.39. These ESs were close to medium effect (ES=0.45) and their practical significance increased relatively.

Table 5

The Means of TCGiftedness and TDS of Different Demographics

Types of a Group	*n*	TCGiftedness *Mean (SD)*	TCGiftedness Effect Size	TDS *Mean (SD)*	TDS Effect Size
Full Sample	834	3.56 (0.38)		3.49(0.51)	
Demographic Groups					

Table 5

The Means of TCGiftedness and TDS of Different Demographics

Grades					
Lower Grade Teachers	352	3.50[a] (0.37)	0.24	3.47(0.47)	
Upper Grades teachers	420	3.59[a] (0.38)		3.51 (0.54)	
Years of Teaching Experience					
1-3 Years	101	3.64[b] (0.37)	0.32	3.52 (0.44)	
4-8 Years	150	3.59 (0.38)		3.50 (0.46)	
9-12 Years	96	3.61 (0.38)		3.49 (0.47)	
13+ Years	486	3.52[b] (0.38)		3.47 (0.4)	
Professional Development					
With Professional Development	197	3.63[c] (0.38)	0.26	3.55[a] (0.52)	0.16
Without Professional Development	636	3.53[c] (0.38)		3.47[a] (0.51)	
The Presence of Gifted Programs in the School					
With Gifted Programs	405	3.61[d] (0.37)	0.37	3.53[b] (0.49)	0.21

Table 5

The Means of TCGiftedness and TDS of Different Demographics

Without Gifted Programs	135	3.62[e] (0.38)	0.39	3.51 (0.53)
Without Knowledge about Gifted Programs	273	3.47[d,e] (0.38)		3.42[b] (0.53)

Note: Same superscript letters indicate means differing significantly at $p < .05$ with the *t*-test or ANOVA with Turkey's post-hoc analysis

Table 6

Means and Standard Deviation of TCGiftedness Items

The Survey Items	Full Sample (*N*=834) *M(SD)*	Lower (*n* = 352) *M(SD)*	Upper (*n* =420) *M(SD)*	1-3 yr (*n*=101) *M(SD)*	4-8 yr (*n*=150) *M(SD)*	9-12 yr (*n*=96) *M(SD)*	13+ yr (*n*=486) *M(SD)*	With Professional Development (*n* = 197) *M(SD)*	Without Professional Development (*n* =636) *M(SD)*	With Gifted Programs (*n*=405) *M(SD)*	Without Gifted Programs (*n*=135) *M(SD)*	Without knowing about Gifted Programs (*n*=273) *M(SD)*
*98th percentile in all subjects	3.66 (0.91)	3.64 (0.95)	3.70 (0.89)	3.83 (0.83)	3.89 (0.87)	3.73 (0.86)	3.54 (0.93)	3.78 (0.89)	3.63 (0.92)	3.66 (0.92)	3.79 (0.93)	3.61 (0.89)
*High IQ over 130	2.71 (0.93)	2.63 (0.90)	2.77 (0.97)	2.78 (0.90)	2.80 (0.99)	2.69 (0.85)	2.66 (0.94)	2.81 (0.89)	2.67 (0.94)	2.76 (0.95)	2.65 (0.96)	2.66 (0.90)
Excellent Performance only in one domain	4.05 (0.88)	3.96 (0.87)	4.12 (0.87)	4.23 (0.75)	4.16 (0.88)	4.11 (0.86)	3.96 (0.90)	4.12 (0.88)	4.03 (0.88)	4.06 (0.91)	4.21 (0.76)	3.99 (0.89)
High capabilities in linguistic intelligence	3.50 (0.96)	3.35 (1.0)	3.61 (0.87)	3.57 (0.90)	3.61 (0.87)	3.56 (1.04)	3.44 (1.00)	3.64 (1.00)	3.45 (0.99)	3.57 (0.99)	3.58 (1.03)	3.37 (0.85)
High capabilities in mathematic intelligence	3.92 (0.84)	3.87 (0.85)	3.97 (0.99)	3.99 (0.77)	4.01 (0.99)	3.98 (0.87)	3.86 (0.84)	4.01 (0.89)	3.89 (0.83)	3.99 (0.81)	4.08 (0.80)	3.77 (0.97)
Leadership ability or potential	3.46 (0.94)	3.45 (0.93)	3.48 (0.84)	3.59 (0.90)	3.55 (0.89)	3.53 (1.02)	3.40 (0.94)	3.60 (0.93)	3.42 (0.94)	3.57 (0.88)	3.51 (1.10)	3.31 (0.82)

Table 6

Means and Standard Deviation of TCGiftedness Items

The Survey Items	Full Sample (*N*=834) *M(SD)*	Lower (*n* = 352) *M(SD)*	Upper (*n* =420) *M(SD)*	1-3 yr (*n*=101) *M(SD)*	4-8 yr (*n*=150) *M(SD)*	9-12 yr (*n*=96) *M(SD)*	13+ yr (*n*=486) *M(SD)*	With Professional Development (*n* = 197) *M(SD)*	Without Professional Development (*n* =636) *M(SD)*	With Gifted Programs (*n*=405) *M(SD)*	Without Gifted Programs (*n*=135) *M(SD)*	Without knowing about Gifted Programs (*n*=273) *M(SD)*
Drama ability or potential	3.49 (0.97)	3.41 (0.99)	3.54 (0.95)	3.55 (0.92)	3.57 (0.87)	3.60 (0.99)	3.43 (0.96)	3.61 (0.98)	3.45 (0.96)	3.59 (0.93)	3.56 (1.10)	3.34 (0.95)
*Malleable intelligence	3.30 (0.89)	3.30 (0.86)	3.31 (0.92)	3.41 (0.91)	3.19 (0.96)	3.37 (0.83)	3.30 (0.86)	3.36 (0.91)	3.28 (0.89)	3.34 (0.87)	3.25 (0.95)	3.27 (0.92)
The development of creativity through training	3.65 (0.79)	3.67 (0.76)	3.64 (0.80)	3.76 (0.85)	3.70 (0.85)	3.55 (0.78)	3.63 (0.76)	3.72 (0.78)	3.63 (0.79)	3.70 (0.79)	3.74 (0.72)	3.55 (0.83)
High achievement due to high motivation than high IQ	3.96 (0.84)	3.89 (0.81)	3.99 (0.87)	3.87 (0.90)	3.88 (0.86)	4.11 (0.79)	3.97 (0.83)	4.04 (0.86)	3.93 (0.83)	4.01 (0.80)	3.99 (0.88)	3.88 (0.87)
Success due to psychosocial factors rather than innate abilities	3.31 (0.92)	3.24 (0.87)	3.30 (0.96)	3.18 (0.92)	3.25 (0.98)	3.42 (0.92)	3.33 (0.90)	3.32 (0.98)	3.30 (0.91)	3.33 (0.90)	3.44 (0.98)	3.20 (0.94)

Table 6

Means and Standard Deviation of TCGiftedness Items

The Survey Items	Full Sample (N=834) M(SD)	Lower (n = 352) M(SD)	Upper (n =420) M(SD)	1-3 yr (n=101) M(SD)	4-8 yr (n=150) M(SD)	9-12 yr (n=96) M(SD)	13+ yr (n=486) M(SD)	With Professional Development (n = 197) M(SD)	Without Professional Development (n =636) M(SD)	With Gifted Programs (n=405) M(SD)	Without Gifted Programs (n=135) M(SD)	Without knowing about Gifted Programs (n=273) M(SD)
*Focus learning and practices on the specialized domain as soon as possible	3.39 (1.03)	3.25 (1.02)	3.53 (1.04)	3.63 (0.90)	3.43 (1.03)	3.44 (0.96)	3.32 (1.01)	3.37 (1.08)	3.40 (1.01)	3.39 (1.03)	3.45 (1.14)	3.37 (0.98)
Enjoyable involvement rather than developing skills	4.01 (0.77)	4.01 (0.73)	4.01 (0.80)	4.09 (0.71)	3.96 (0.77)	4.04 (0.71)	4.00 (0.79)	4.04 (0.76)	4.00 (0.77)	4.05 (0.75)	4.16 (0.70)	3.90 (0.80)

Note: Same asterisks (*) indicate that those items were reverse-coded.

The Trends of General Perceptions of Korean Elementary Teachers Related to Traditional and Contemporary Giftedness

Regarding the construct of TCGiftedness, multiple comparisons were not conducted in this study because of the possibility of increased false positives (Type I errors) due to repetitious analysis. However, in relation to individual survey items comprising TCGiftedness, the following two aspects were explored. First, to obtain the bigger picture about this data, the overall trend of the survey items was investigated. That is, through overall individual items displayed through ranking orders, trends in this data were investigated. From these trends, common themes were drawn, if any were seen. Second, in order to see the more detailed picture, individual items showing the same theme were grouped into thematic categories (e.g., identifying giftedness and domain-specific giftedness). Next, aspects about what general perceptions Korean elementary teachers have regarding survey items within each thematic category were investigated. The following section will present the results.

Korean elementary teachers' common perceptions about individual items displayed in ranking order related to TCGiftedness. The overall trend of individual items comprising TCGiftedness is based on ranking order. The following overall trends were seen in the aforementioned items (see Figure 1). The first trend was that participants demonstrated conflicting perceptions in individual items pertaining to one topic. Due to this, they showed considerably disparate rankings in those statements. Specifically, in statements asking about perceptions of giftedness in one domain, respondents firstly showed the highest rank in the general statement that students with excellent performance in only one domain are gifted. However, regarding specific domains, they showed conflicting perceptions in that their responses to academic giftedness were located in the highest ranking group, but their responses to nonacademic giftedness were relatively lower ranking.

Also, regarding the topic of the roles of psychosocial factors and innate abilities in talent development, participants showed the near-highest ranking in the statement that psychosocial factors are more important than innate abilities to accomplish high achievement. Conversely, they showed relatively low rankings in the survey item stating that psychosocial factors are more important than innate abilities in accomplishing success, even though success is a kind of high achievement. Thus, it is possible to interpret that the tendency to emphasize the role of innate abilities in the success of a specific field may be associated with the tendency to place considerable emphasis on high IQ in identifying giftedness.

Secondly, ranking of the survey items was shown to be associated with the participants' consideration of the necessity for gifted students' talent development within the context of Korean education. For example, as the previous section explains, private education is thriving in Korea (Lee, 2014) and parents' desire for their children's success is considerably strong. Thus, it is possible that participants may perceive that for gifted students to develop their talents appropriately, it is necessary for them to enjoy the talent development process. Therefore, they showed the highest ranking in the statement that enjoyable involvement is more important than developing skills. Also, they showed the lowest ranking in the statement that students should focus on learning in a specialized domain as soon as possible.

In addition, they showed a relatively high ranking in response to the statement that creativity can be developed through training programs. It is likely that such an outcome may be associated with the consideration that creativity training is necessary for gifted students' talent development. It is also likely that this perception was influenced by the Korean educational context in which the third comprehensive plan for gifted education (2013) encouraged the development of creativity through training.

The common perceptions of Korean elementary teachers within the thematic categories related to TCGiftedness. When investigating participants' common perceptions about survey items included within each thematic category, the following general perceptions of respondents were obtained. In judging the orientation of participants' perceptions, the same criteria used in the full sample were employed. First of all, with regard to identifying giftedness, Korean elementary teachers in this study showed the following overall trend. They oriented more toward the contemporary giftedness related to high achievement. This means that participants showed a relatively lower average of agreement (less than 3) with the statement that students who score 98th perceptions in all subjects are gifted. On the contrary, they leaned more toward traditional giftedness related to IQ. This means that participants showed relatively a higher average of agreement (more than 3) with the statement that students who have a high IQ over 130 are gifted (Figure 2). Although high IQ and high achievement in all subjects have been traditionally used in identifying students' giftedness, respondents had a greater tendency to think that gifted students should possess high IQs than demonstrate high achievements. Although Seoul public schools do not use an IQ test as an identification method, IQ still may affect teachers' perceptions in identifying giftedness.

Korean elementary teachers in this study demonstrated higher averages of agreement with the general statement that students who show excellent performance in only one domain are gifted. In contrast, they displayed overall different perceptions depending on the specific domain. For example, in academic domains (i.e., math), they showed higher averages of agreement, matching the averages that they showed in the general statement related to domain-specific giftedness. However, in nonacademic domains (i.e., drama), they showed lower averages of agreement. Thus, Figure 2 shows the trend that Korean elementary teachers had higher perceptions of giftedness in the academic domains (e.g., math and spatial domains) and lower perceptions of giftedness in the language domain and nonacademic domains (e.g., leadership and drama).

Korean elementary teachers leaned more toward a contemporary perception related to the development of creativity through training, by showing higher averages (see Figure 2). However, participants leaned relatively less toward the contemporary approach related to intelligence._This result means that participants showed a higher trend in the statement that creativity can be improved through training than in the statement that intelligence can be malleable (Figure 2).

In their perceptions of the roles of psychosocial factors and innate abilities related to successful talent development, participants showed contradictory views. They perceived that high motivation is more important than high IQ in accomplishing high achievement (Figure 2). That is, their perceptions leaned more toward the contemporary approach related to demonstrating high achievement. However, they showed lower averages in response to the statement that psychosocial factors are more critical than innate abilities in achieving success in the professional field. Participants leaned slightly toward a contemporary approach regarding success in a specific field. This can be speculated that Korean elementary teachers perceived that to succeed in a specific domain beyond merely showing high achievement, it is necessary to have innate abilities as well as psychosocial strengths.

Finally, Korean elementary teachers in this study showed the common trend that they put more emphasis on enjoyable involvement rather than developing skills in finding and developing talents (Figure 2). That is, participants showed more of an inclination toward contemporary perception related to finding talents at the earliest stage. By emphasizing enjoyable engagement in the domain, they showed desirable perceptions. However, although the perceptions of participants leaned slightly toward the contemporary approach concerning students' early focus on learning and practices in the specialized domain, some participants (around 20.0%) did not completely abandon a traditional perception.

Figure 1. Korean elementary teachers' (N=834) general perceptions in individual items comprising TCGiftedness in terms of ranking order

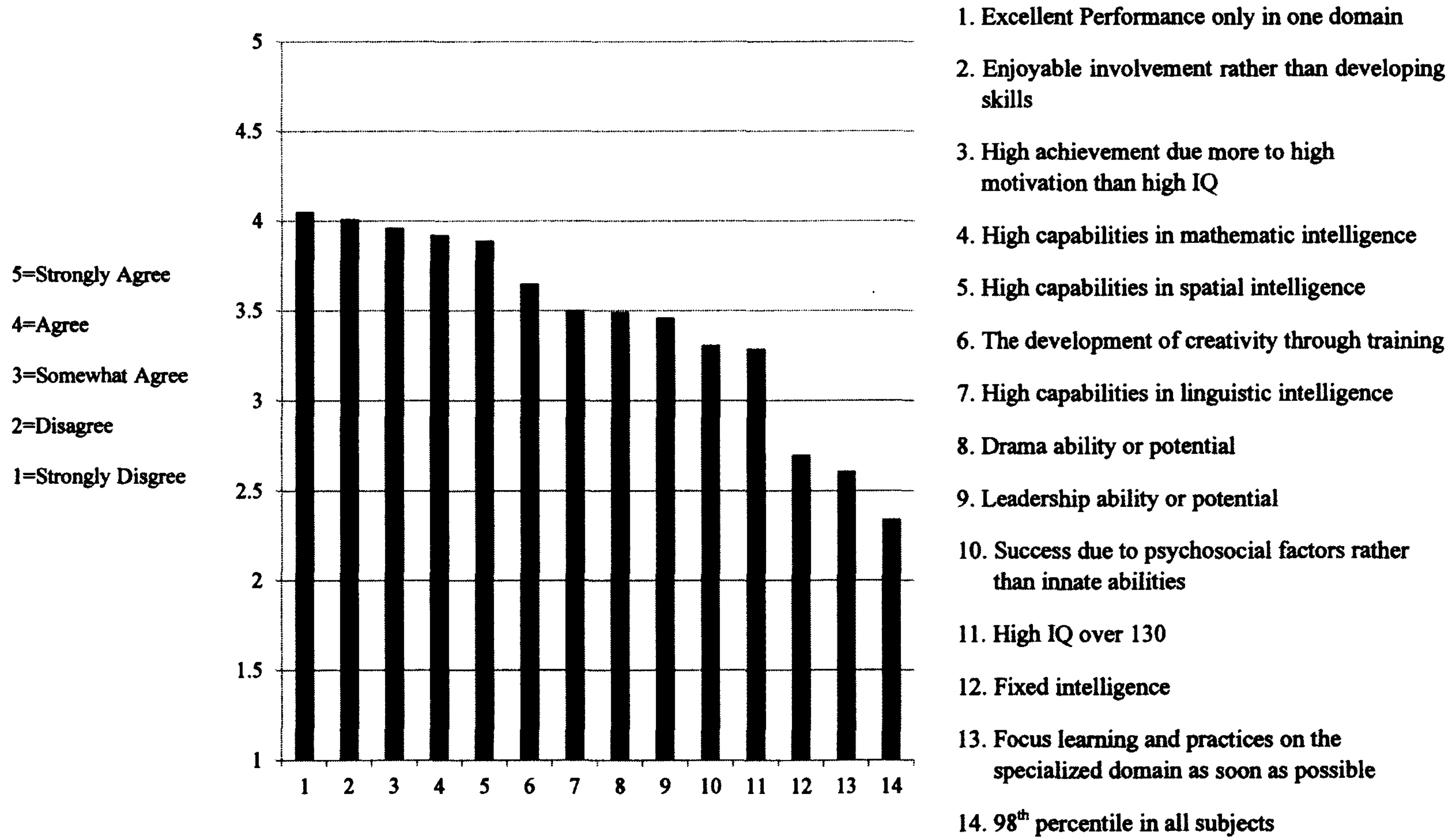
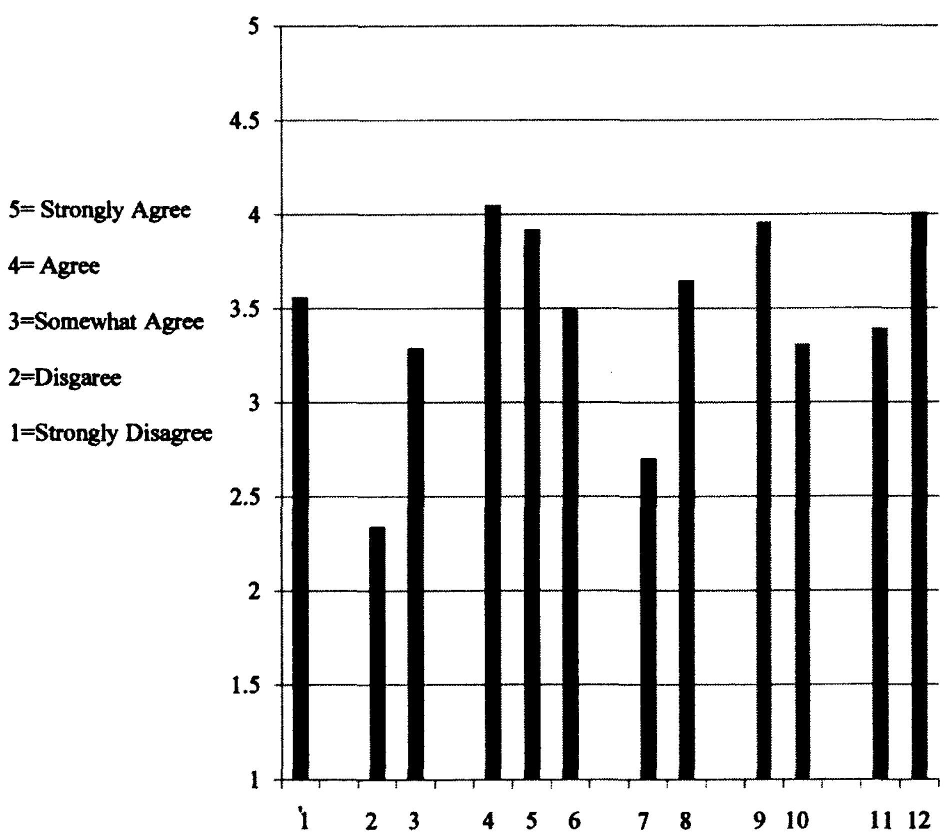


Figure 2. Korean elementary teachers' (*N*=834) general perceptions in individual items comprising TCGiftedness in terms of thematic categories



1. TCGiftdness
2. Students who score 98th percentile in all subjects are gifted.
3. Students who have high IQ over 130 are gifted
4. Students who show excellent performance only in one domain are gifted.
5. Students who show high capability in math are gifted.
6. Students who show high capabilities in drama are gifted.
7. You cannot do much to change intelligence.
8. Creativity can be developed through training.
9. Gifted students show high achievement due more to high motivation than high IQ.
10. Success is due more to psychosocial factors than innate abilities.
11. It is better for gifted students to early focus on their learning in the specialized domain.
12. In finding students' talents, it is more important to have enjoyable involvement than to develop skills.

Research Question Two

What perceptions do Korean elementary teachers have regarding teaching gifted students related to talent development?

To answer this research question, this study was designed to examine how much Korean teachers support making accommodations to develop gifted students' talents in their teaching. The construct of talent development support (TDS) was created to find Korean elementary teachers' perceptions related to support for the accommodation of teaching practices for students' talent development. Firstly, the mean score of the full sample was investigated. Through this score, the perceptions of the full sample in relation to teaching gifted students for talent development were investigated. Secondly, to further explore Korean elementary teachers' perceptions about support for talent development in their teaching, the TDS means of diverse demographic groups based on the previous four variables were explored. Through these comparisons, their different perceptions related to TDS were investigated. Table 5 shows the results of the comparison for corresponding demographic groups. Finally, the trends of scores in individual items comprising TDS were investigated from two approaches (Figure 3-4). Through overall ranking trends of mean scores of survey items, participants' general perceptions related to TDS were investigated. Moreover, within the thematic categories into which individual items were grouped, respondents' common perceptions were explored. Both the mean scores of a full sample and diverse demographic groups in each survey item related to TDS are presented in Table 7 and detailed responses to the survey items can be found in Appendix H.

The Perceptions of the Full Sample Related to Talent Development Support

In analyzing data of a full sample related to TDS, the score 3 was chosen as the mid-point and scores over 3, *Somewhat Agree,* were regarded as showing high support for the accommodation of teaching practices for students' talent development. Scores under 3 were considered to indicate low support for the accommodation of teaching practices. As a result of data analysis, the full sample showed a mean score of 3.49 in TDS. This means that overall, Korean elementary teachers who participated in this study agreed with the accommodation of teaching practices to develop gifted students' talents. However, the degree of the accommodation was not drastically high.

The Different Perceptions among Demographic Groups Related to Talent Development Support

In the following section, it was investigated how Korean elementary teachers' perceptions related to TDS are different in demographic groups formed by the previous four variables. The results regarding whether these demographic groups showed the statistically significant differences in participants' perceptions were presented.

The perceptions of lower and upper grades Korean elementary teachers related to TDS. The independent samples *t*-test was used to identify whether the difference (0.04) in mean TDS scores of upper and lower grade teachers was statistically significant (see Table 5). Because the Levene's test $F = 5.49$ was significant ($p > .05$), equal variance was not assumed. With an alpha level of .05 and a two-tailed test, the mean score ($M = 3.51$, $SD = .54$) of the upper grades teachers was not significantly higher than the mean score ($M = 3.47$, $SD = .47$) of the lower grades teachers, $t\ (763) = .39$, $p > .05$. The *t*-test indicated that the difference in mean score between the two groups was not statistically significant. Upper and lower grade teachers showed similar perceptions related to their support of accommodation needed for talent development.

The perception of Korean elementary teachers with different years of teaching experience related to TDS. Mean TDS scores of survey items related to talent development support of teachers with different years of teaching experience appear in Table 5. To determine whether the difference in mean TDS scores among four groups with different years of teaching experience is statistically significant or not, the analysis of ANOVA was conducted. Because Levene statistic was not significant, the assumption of homogeneity of variance was met. With an alpha level equal to .05, the ANOVA indicated the difference in mean scores of these groups was not statistically significant, F (3,829) = .27, $p > .05$. Teachers with different years of teaching experience did not differ in their willingness to make accommodations for the development of students' talent.

The perceptions of Korean elementary teachers with or without professional development related to TDS. In an independent samples t-test of TDS scores between teachers with or without professional development (see Table 5), equal variance was not assumed (Levene's test, F = .00 was significant). With an alpha level of .05 and a two-tailed test, the mean score (M = 3.55, SD = .52) of the group with professional development was significantly higher than the mean score (M = 3.47, SD = .51) of the group without professional development, t (321) = 2.07, $p < .05$. This means that teachers with professional development showed significantly higher support than those without professional development for the accommodation of teaching practices for gifted students' talent development. When calculating the ES between these two groups, the ES of 0.16 was obtained. This small ES indicates that the effect's practical significance is negligible.

The perceptions of Korean elementary teachers related to TDS according to the presence of gifted programs in the school. TDS scores of teachers with, without, or with no knowledge about school gifted programs were investigated (see Table 5). Because Levene's test of equality of variance was not significant, the assumption of homogeneity of variance was met. With alpha equal to .05, the ANOVA indicated a significant difference in mean scores of these groups, $F\,(2, 810) = 4.19, p < .05$. The $p < .05$ indicated that at least one difference among the three group means was statistically significant.

To investigate which group means were different from one another, the Tukey test, a post hoc test, was conducted. The mean score of the group with gifted programs was significantly higher than the mean score of the group with no knowledge about gifted programs. However, there was no significant difference in mean scores between the group without gifted programs and the group with no knowledge about gifted programs or between the group with gifted programs and the group without gifted programs (see Table 5). The ES between the group with gifted programs and the group with no knowledge about gifted programs was 0.21. This meant that there was little practical importance in the differences between the two groups' perceptions.

Table 7

Means and Standard Deviations of TDS Items

The Survey Items	Full Sample (*N*=834) *M*(*SD*)	Lower (*n* = 352) *M*(*SD*)	Upper (*n* = 420) *M*(*SD*)	1-3 (*n* = 101) *M*(*SD*)	4-8 (*n* = 150) *M*(*SD*)	9-12 (*n* = 96) *M*(*SD*)	13+ (*n* = 486) *M*(*SD*)	With Professional Development (*n* = 197) *M*(*SD*)	Without Professional Development (*n* = 636) *M*(*SD*)	With Gifted Program (*n* = 405) *M*(*SD*)	Without Gifted Program (*n* = 135) *M*(*SD*)	Without Knowledge about Gifted Program (*n* = 273) *M*(*SD*)
The start of formal identification as soon as possible	2.90 (1.00)	2.99 (1.00)	2.84 (1.02)	2.98 (1.00)	2.81 (0.96)	2.83 (0.93)	2.92 (1.03)	2.99 (1.00)	2.87 (1.00)	2.92 (1.00)	2.92 (1.07)	2.86 (0.99)
The elimination of mastered curricular materials	2.80 (1.02)	2.79 (1.00)	2.81 (1.03)	2.35 (0.96)	2.70 (1.04)	2.88 (0.97)	2.91 (1.01)	2.86 (1.03)	2.78 (1.02)	2.81 (1.04)	2.79 (1.15)	2.79 (0.94)
The assignment of enrichment work	3.03 (1.04)	3.07 (1.01)	2.99 (1.03)	3.00 (1.00)	2.75 (1.07)	2.90 (0.95)	3.14 (1.04)	3.06 (1.07)	3.02 (1.03)	3.06 (1.06)	3.03 (1.07)	2.97 (1.01)
Teaching strategies to elicit high-level thinking	3.76 (0.84)	3.75 (0.81)	3.76 (0.85)	3.97 (0.77)	3.81 (0.80)	3.69 (0.89)	3.71 (0.86)	3.87 (0.80)	3.73 (0.85)	3.84 (0.82)	3.86 (0.86)	3.60 (0.85)
The assignment of different homework	3.50 (0.94)	3.50 (0.93)	3.50 (0.93)	3.70 (0.91)	3.37 (0.97)	3.44 (0.84)	3.51 (0.96)	3.52 (0.91)	3.50 (0.95)	3.52 (0.94)	3.52 (0.98)	3.47 (0.92)
The lesson for creativity within regular curriculum	2.43 (0.96)	2.43 (0.96)	2.45 (0.98)	2.58 (0.95)	2.29 (1.03)	2.40 (0.88)	2.46 (0.91)	2.48 (0.95)	2.42 (0.97)	2.41 (0.94)	2.43 (1.04)	2.46 (0.97)
The implementation of pull-out programs	3.83 (0.99)	3.86 (0.95)	3.82 (1.03)	3.83 (0.96)	3.96 (1.00)	3.80 (0.95)	3.79 (1.00)	3.87 (1.03)	3.82 (0.97)	3.87 (0.98)	3.88 (1.09)	3.75 (0.98)

Table 7

Means and Standard Deviations of TDS Items

The Survey Items	Full Sample (*N*=834) *M*(*SD*)	Lower (*n* = 352) *M*(*SD*)	Upper (*n* = 420) *M*(*SD*)	1-3 (*n* = 101) *M*(*SD*)	4-8 (*n* = 150) *M*(*SD*)	9-12 (*n* = 96) *M*(*SD*)	13+ (*n* = 486) *M*(*SD*)	With Professional Development (*n* = 197) *M*(*SD*)	Without Professional Development (*n* = 636) *M*(*SD*)	With Gifted Program (*n* = 405) *M*(*SD*)	Without Gifted Program (*n* = 135) *M*(*SD*)	Without Knowledge about Gifted Program (*n* = 273) *M*(*SD*)
Systematic programs for nonacademic domain talent during regular hours	2.59 (0.94)	2.50 (0.89)	2.63 (0.97)	2.72 (0.97)	2.53 (0.89)	2.55 (1.00)	2.59 (0.96)	2.62 (1.00)	2.58 (0.93)	2.60 (0.95)	2.53 (0.98)	2.60 (0.94)
The increase of frequency for daily challenges	3.37 (0.94)	3.34 (0.94)	3.43 (0.96)	3.34 (0.97)	3.41 (0.98)	3.33 (0.94)	3.37 (0.95)	3.53 (0.90)	3.32 (0.95)	3.49 (0.90)	3.23 (1.04)	3.26 (0.94)
Free programs for all students to develop nonacademic talent	2.68 (1.06)	2.58 (1.03)	2.74 (1.07)	2.64 (1.07)	2.63 (1.09)	2.55 (1.00)	2.73 (1.09)	2.69 (1.10)	2.67 (1.04)	2.71 (1.00)	2.70 (1.15)	2.64 (0.94)
The employment of out-of school gifted programs	3.91 (0.83)	3.93 (0.80)	3.91 (0.86)	3.91 (0.86)	4.06 (0.81)	3.84 (0.72)	3.88 (0.87)	3.92 (0.84)	3.90 (0.83)	3.99 (0.77)	3.98 (0.90)	3.75 (1.03)
Grouping by ability in the class	3.02 (1.02)	2.99 (1.00)	3.06 (0.91)	3.06 (1.04)	3.05 (1.05)	2.89 (1.01)	3.03 (1.02)	3.18 (1.04)	2.98 (1.01)	3.04 (1.00)	3.05 (1.14)	2.97 (0.86)
Grouping by interest	3.32 (1.03)	3.21 (1.02)	3.42 (1.04)	3.42 (1.04)	3.37 (1.04)	3.27 (0.95)	3.28 (1.04)	3.39 (1.03)	3.29 (1.03)	3.37 (1.02)	3.27 (1.15)	3.29 (1.00)
Pull-out programs	3.76 (0.97)	3.72 (0.98)	3.80 (0.97)	3.80 (0.97)	3.95 (0.78)	3.76 (0.95)	3.70 (1.02)	3.86 (0.91)	3.72 (0.99)	3.84 (0.93)	3.66 (1.12)	3.70 (0.97)

Table 7

Means and Standard Deviations of TDS Items

The Survey Items	Full Sample (*N*=834) *M*(*SD*)	Lower (*n* = 352) *M*(*SD*)	Upper (*n* = 420) *M*(*SD*)	1-3 (*n* = 101) *M*(*SD*)	4-8 (*n* = 150) *M*(*SD*)	9-12 (*n* = 96) *M*(*SD*)	13+ (*n* = 486) *M*(*SD*)	With Professional Development (*n* = 197) *M*(*SD*)	Without Professional Development (*n* = 636) *M*(*SD*)	With Gifted Program (*n* = 405) *M*(*SD*)	Without Gifted Program (*n* = 135) *M*(*SD*)	Without Knowledge about Gifted Program (*n* = 273) *M*(*SD*)
The after-school programs by out-of-school professionals in nonacademic domains	4.03 (0.77)	4.05 (0.72)	4.03 (0.82)	4.03 (0.82)	4.08 (0.82)	4.04 (0.72)	4.01 (0.78)	4.05 (0.77)	4.02 (0.78)	4.10 (0.75)	4.00 (0.83)	3.97 (0.78)
Mentorship	4.01 (0.78)	4.01 (0.74)	4.02 (0.82)	4.02 (0.82)	4.09 (0.79)	4.14 (0.75)	3.97 (0.77)	4.07 (0.75)	3.99 (0.79)	4.09 (0.74)	3.99 (0.82)	3.95 (0.80)
Field trip to professionals	4.04 (0.78)	4.01 (0.74)	4.08 (0.82)	4.08 (0.82)	4.11 (0.82)	4.10 (0.75)	3.99 (0.79)	4.11 (0.77)	4.02 (0.79)	4.12 (0.76)	4.05 (0.78)	3.95 (0.80)
Special schools for talent development	3.81 (0.95)	3.80 (0.92)	3.82 (0.97)	3.82 (0.97)	3.91 (0.93)	3.97 (0.86)	3.77 (0.94)	3.97 (0.86)	3.75 (0.79)	3.87 (0.92)	3.90 (0.89)	3.69 (1.01)
Online learning	3.54 (0.93)	3.53 (0.86)	3.55 (1.00)	3.55 (1.00)	3.50 (0.97)	3.69 (0.97)	3.53 (0.90)	3.60 (1.01)	3.51 (0.97)	3.54 (0.98)	3.66 (0.90)	3.47 (0.90)
Creativity training programs	3.93 (0.78)	3.90 (0.76)	3.96 (0.80)	3.96 (0.80)	3.90 (0.84)	3.95 (0.83)	3.90 (0.76)	4.03 (0.78)	3.89 (0.91)	3.99 (0.78)	4.05 (0.72)	3.79 (0.80)
Training programs for psychological skills	3.96 (0.77)	3.93 (0.72)	4.00 (0.83)	4.00 (0.83)	4.00 (0.85)	4.00 (0.81)	3.92 (0.75)	4.03 (0.80)	3.94 (0.76)	4.05 (0.73)	3.96 (0.80)	3.85 (0.81)
The presentation of talents	3.73 (0.89)	3.69 (0.85)	3.77 (0.93)	3.77 (0.93)	3.76 (0.85)	3.79 (0.92)	3.69 (0.89)	3.82 (0.87)	3.70 (0.90)	3.80 (0.87)	3.77 (0.83)	3.64 (0.95)
Participation in competitions	3.77 (0.89)	3.76 (0.84)	3.79 (0.95)	3.79 (0.95)	3.90 (0.82)	3.89 (0.88)	3.69 (0.94)	3.76 (0.94)	3.78 (0.88)	3.78 (0.90)	3.85 (0.82)	3.73 (0.93)

The Trends of General Perceptions of Korean Elementary Teachers Related to Talent Development Support

Regarding the construct of TDS, multiple comparisons were not conducted in this study for the same reason that they were not conducted in TCGiftedness. However, the following two aspects of individual survey items related to TDS were explored. First, the overall trend of the survey items comprising TDS was investigated. The overall ranking orders of individual items allowed the researcher to explore trends in the data. Also, common themes within these trends were elicited, if any were noted. Second, individual items were grouped into thematic categories (e.g., teaching practices for academic talent development, teaching practices for nonacademic talent development and gifted services to be provided for talent development) that showed specific themes. Then, aspects regarding what common perceptions Korean teachers have about each thematic category were investigated. The results will be presented in the following section.

Overall trend of individual items regarding TDS demonstrated through ranking order. The following overall trends were found when 24 individual items comprising TDS were displayed according to ranking order. First, participants showed the highest trend of rankings in most of the gifted service options (e.g., field trip, mentorship, after-school program in more diverse domains) listed in Part 8 of the survey. This trend showed that, overall, they agreed most highly with practices and gifted services that are necessary and beneficial for gifted students' talent development, despite any limitations. However, as the second trend shows, if practices and gifted services were beneficial for gifted students' talent development, but limitations or prerequisites were equally significant, then participants showed relatively lower trends. For example, online learning and the provision of daily challenges through increased frequency of participation in nonacademic after-school programs are beneficial for gifted students. However, prerequisites or limitations (e.g., budget or the necessity of technical resources like computers) should be considered when implementing practices and gifted services. Thus, this trend showed that considerations of feasibility and practicality in implementing services and practices may be associated with lower agreement. Finally, participants showed the lowest trends for gifted practices and services that required large changes in the current educational system or that might bring significantly negative consequences after implementation. For example, the survey items (e.g., free programs for all students to develop nonacademic talent and the elimination of mastered curriculum) showing this trend tended to meet such a description.

The common perceptions of Korean elementary teachers within the thematic categories related to TDS. When the individual items comprising TDS were divided according to each thematic category, four thematic categories (e.g., teaching practices for academic or nonacademic talent development and the gifted service options to be provided) were found. When investigating participants' common perceptions, the criterion of score 3, *Somewhat Agree*, was used because scores over 3 showed incremental levels of agreement and scores under 3 indicated incremental levels of disagreement. First, Korean elementary teachers showed relatively low averages below 3 for the early start of formal identification that allows gifted students to participate in gifted programs for academic and nonacademic talent development (Figure 4). In relation to teaching practices for academic talent development, overall, Korean elementary teachers in this sample did not demonstrate high averages around or under the score of 3 regarding differentiation practices during regular school hours (e.g., the assignment of enrichment work or curriculum compacting; see Figure 4). On the contrary, the means presented in Figure 4 appeared higher for pull-out programs, where gifted students go to other classrooms to participate in more enriched learning activities. Participants' responses to teaching strategies to elicit high-level thinking skills showed a similar ranking to their responses to pull-out programs, although these can be used during regular class time (Figure 4). One unique point was that while Korean elementary teachers showed relatively higher averages in response to the creativity training program as a gifted service option, they demonstrated relatively lower averages in response to the lessons for creativity within the regular curriculum (Figure 4).

Regarding practices for nonacademic talent development, Korean elementary teachers in this sample again did not show a high trend of agreement with programs during regular school hours, as seen in Figure 4. However, the means presented in Figure 4 for after-school programs and out-of-school programs appeared higher. Although the trends were relatively higher in gifted service options for nonacademic talent development such as the after-school programs by out-of-school professionals in nonacademic domains and after-school programs in more diverse domains, they showed relatively lower averages in free programs that allow all students to nurture their nonacademic talents (Figure 4).

Finally, in the gifted service options to be provided, Korean elementary teachers in this study represented a conspicuous trend. While they showed higher averages in most gifted service options (e.g., special schools for talent development or the after-school programs in more diverse domains), they indicated a relatively lower trend in grouping practices (i.e., grouping by ability in the class). This again demonstrated that practices implemented in the regular classroom during school hours, like grouping practices (e.g., grouping by ability or grouping by interest), did not obtain high averages from participants (Figure 4). It could be interpreted that in deciding whether the provision of gifted services should be supported, Korean elementary teachers' consideration of the practicality or feasibility might be reflected.

Figure 3. Korean elementary teachers' (N=834) general perceptions in individual items related to TDS in terms of ranking order

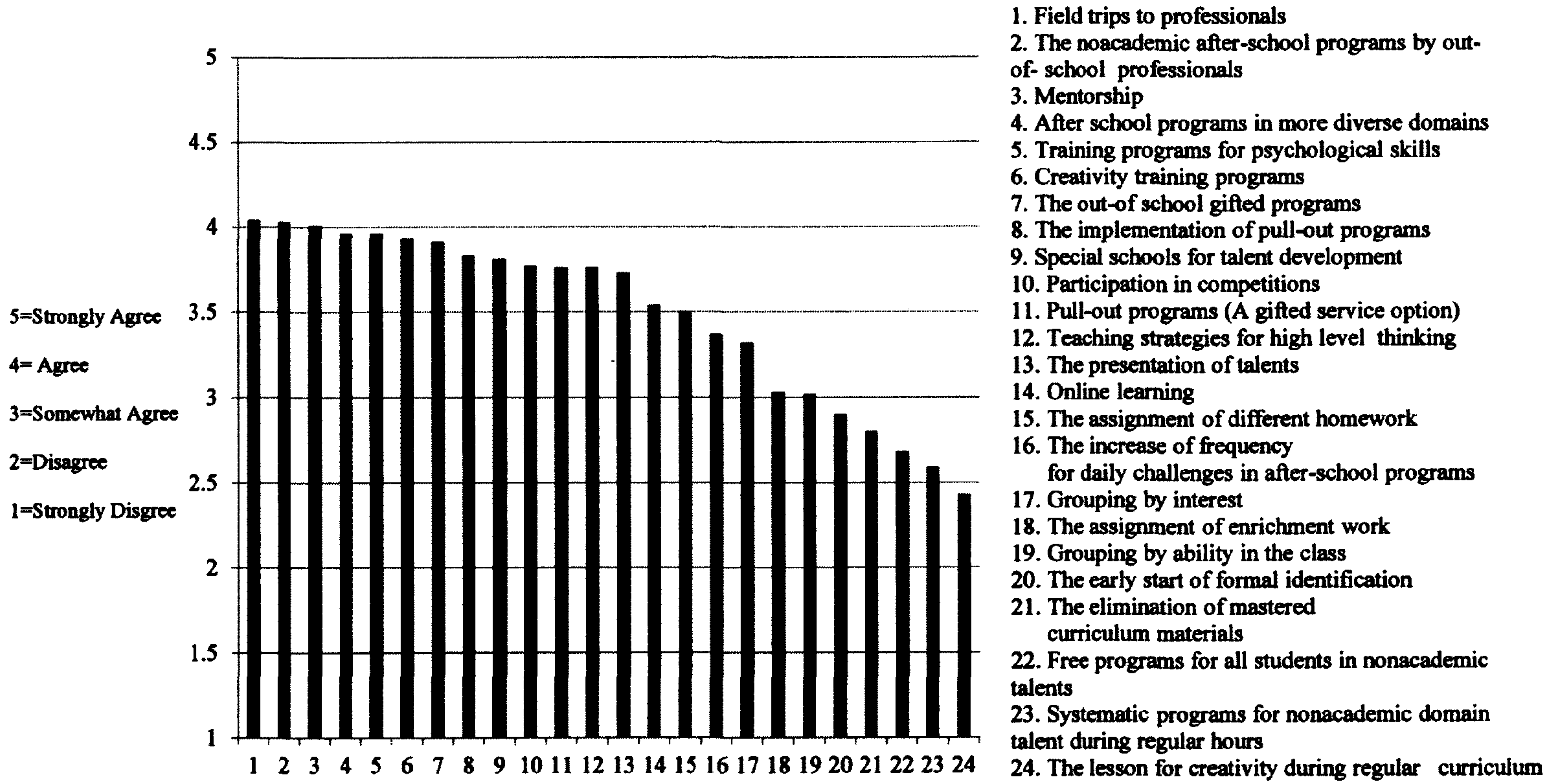
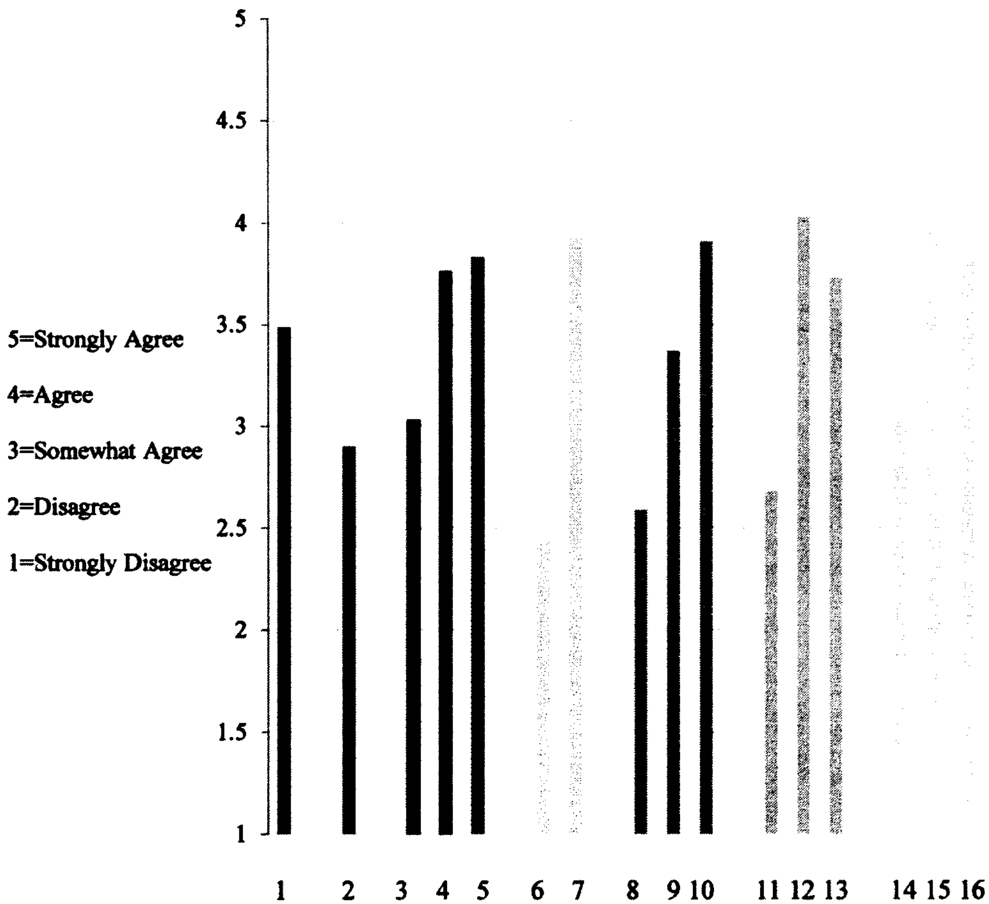


Figure 4. Korean elementary teachers' (*N*=834) general perceptions in individual items comprising TDS in terms of thematic categories



1. TDS
2. The early start formal identification
3. The assignment of enrichment work during class
4. The use of teaching strategies to elicit high-level thinking
5. The implementation of pull-out programs during regular school hours
6. Teachers should include creativity lesson within regular curriculum.
7. The creativity training programs
8. Nonacademic talent development Programs during regular hours
9. The increased frequency of participation in after-school programs
10. Out-of-school programs for nonacademic talent development.
11. Free programs for all students for nonacademic talent
12. The nonacademic after-school programs by out-of-professionals
13. The opportunity to present talents
14. Grouping by ability in the class
15. After-school programs in more diverse domains
16. Special schools for talent development

Open-Ended Question Responses

The survey included two open-ended questions: 1) "What do you think is the goal of gifted education?" and 2) "Please share any comments you may have about gifted education in Korea." Out of 834 participants, 337 responded to Question 1 (40.4%) and 237 teachers responded to Question 2 (28.4%). When analyzing responses to the open-ended questions, according to the analysis methods described in Chapter 3, four major themes in Question 1 and five major themes in Question 2 were found. To determine a major theme, the following criteria were used. If more than 20 respondents commented about the theme, it was considered a major theme. In addition, themes with 10-19 respondents were not disregarded, but were labeled as minor themes. Responses representing multiple themes were counted in each theme. The purpose of this strategy was to respect teachers' opinions and thoughts expressed in open-ended questions. As a result, although 337 participants gave their opinions in open-ended Question 1, the number of comments analyzed increased to 509 comments because some respondents mentioned multiple themes in a single comment. Likewise, although 237 participants gave their opinions in open-ended Question 2, the number of comments was 282. Tables 8 and 9 show the major and minor themes and exemplar comments.

When analyzing open-ended Question 1 about the goal of gifted education, the most frequent comment (50.5% of total comments) was "The goal of gifted education is to identify and to develop gifted children's diverse talents." This was followed by "the contribution to society and country" (28.7%). In addition, the goal of "individual happiness and self-actualization" (10.6%) and the goal of "the provision of better and more systematic educational opportunities for gifted children" (5.7%) were commented upon. Some comments (4.5%) did not mention these themes.

In response to open-ended Question 2, "Please share any comments you may have about gifted education in Korea," five major themes and two minor themes were found. The most frequently commented theme (23.4% of total comments) was "the necessity to implement more systematic gifted programs and to create an environment for implementing appropriate gifted education." With an equal number of responses, "the prosperity of private education due to excessive parental involvement and the implementation of inappropriate gifted education" and "the provision of more opportunities for more gifted students" tied as the second major theme (19.5%; 19.5%)." Although minor themes had a lower frequency than the major themes, the difference was not very large. For example, Theme 5 is a major theme with 7.5% while Theme 6 is a minor theme with 6.7%. Thus, two minor themes and other comments are indicated in Table 9.

Table 8

Inductively Developed Themes in Open-Ended Questions 1: "What do you think is the goal of gifted education?"

Theme number	Thematic category	The number of cases included (The rate of cases Included in this theme among total 509 comments)	Key theme	Exemplar comments
Theme 1	Major	257 (50.5%)	The identification and development of gifted children's diverse talent	Efficient education, the identification and development of potential(case 129) The development of excellent ability in a special domain(case 372) Assisting the identification of gifted students and helping them to improve(case 464)
Theme 2	Major	146 (28.7%)	Contribution to society and country through gifted students' talents	Contribution to society and country through the exertion of one's potential(case 75) The development of a talented individual that can contribute to the improvement of the country(case 444) Contribution to society through each individual's excellent talent(case 627)

Table 8

Inductively Developed Themes in Open-Ended Questions 1: "What do you think is the goal of gifted education?"

Theme 3	Major	54 (10.6%)	Individual happiness and self-realization	The pursuit of happiness through accomplishment by developing one's talent to the fullest (case 71) The pursuit of gifted students' happiness(case 356) The happy life and self-actualization of a gifted student(case 424)
Theme 4	Major	29 (5.7%)	The provision of better and more systematic educational opportunities for gifted children to accomplish excellent achievement	The earlier identification and the expansion of educational opportunities for gifted students (case 447) The pursuit of accomplishing excellent achievement in education (case 700) To raise gifted students and to make a system while raising gifted students (case 812)
Others		23 (4.5%)		Upbringing the leader (case 411); The identification top 1% in this country (case 715)
Total		509 (100.0%)		

Note: This data was translated from Korean responses.

Table 9. *Inductively Developed Themes in Open-Ended Questions 2: "Please share any comments you may have about gifted education in Korea*

Theme number	Thematic category	The number of cases included (The rate of cases Included in this theme among total 282 comments)	Key theme	Exemplar comments
Theme 1	Major	66 (23.4%)	The necessity to implement more systematic gifted programs and to create an environment for implementing appropriate gifted education	A public institution must administer and systematically operate gifted education (case 69). There needs to be a systematic and diverse gifted educational curriculum. There is still a lack of experts (case 165). It would be good if gifted education systems were operated more systematically and if more experts could have a chance to teach students.(case 199) There is the lack of a systematic curriculum and gifted education system (case 299).
Theme 2	Major	55 (19.5%)	The prosperity of private education due to excessive parental involvement and the implementation of inappropriate	There are too many institutions geared towards making gifted students.(case 8) The reality is that children pretending to be gifted are being forced out into private educational institutions.(case 179) Parents are imposing their desires to have a special child in private

Table 9. *Inductively Developed Themes in Open-Ended Questions 2: "Please share any comments you may have about gifted education in Korea*

			gifted education	education (case 312). Private education has been invigorated under the name of gifted education (case 766)
Theme 3	Major	55 (19.5%)	The provision of more opportunities for more gifted students	Because gifted education is not actively implemented yet in Korea, there are few gifted programs. It is necessary to implement gifted programs in more diverse domain (case 11). I recognize that gifted education is necessary, but the regrettable truth is that it is very hard to be implemented in small elementary schools. It is also necessary to develop giftedness in non-academic areas, and not just in math and science (case 86). There should be sufficient opportunities provided for gifted students (fees supported by the government) (case 226). There needs to be a free educational program to identify gifted children because underprivileged students live without ever realizing the talent they have (case 774)
Theme 4	Major	27 (9.6%)	There needs to be a valid and reliable standard to measure giftedness.	A reliable and valid test needs to be developed and used for identifying gifted students.(case 278) There needs to be a correct standard of giftedness, not just being academically successful.(case 289) More diverse and systematic ways of identifying giftedness need to be developed. The most commonly used paper-and-pencil and interviews

Table 9. *Inductively Developed Themes in Open-Ended Questions 2: "Please share any comments you may have about gifted education in Korea*

				where linguistic skills play a huge part leads to students who have talent but lack verbal skills are not being picked (case 295) An outside expert should identify gifted students for objectivity (case 398).
Theme 5	Major	21 (7.5%)	Gifted education tends to be means to get into good colleges.	I think there needs to be a change in parents' perceptions that gifted education is just another part of getting into a good school (case 204). There needs to be a change in the perception of parents towards gifted education. There is a tendency for gifted education to be used as a means of getting into a high-level college (case 226). Korea's gifted education tends to be perceived as a means of getting into specialized institutions or prestigious universities due to parents' incorrect perceptions.(case 382) There is a problem with the reality that gifted education is being treated as a way to get into a better college due to the fierce competition. (case 801)

Table 9. *Inductively Developed Themes in Open-Ended Questions 2: "Please share any comments you may have about gifted education in Korea*

Theme 6	Minor	19 (6.7%)	The appropriate education for socioemotional development and character education for gifted students should be implemented and this should be connected with the contribution to society.	It is important to develop and implement diverse gifted programs for special talent development, but the utmost goal of gifted education should be to raise a child who is happy through appropriate education according to the stages of socioemotional development(case 26) I think that there is a problem with earlier gifted education and students boasting that they are gifted. Gifted education should put an emphasis on building an upright character. (case 198) In order for gifted students' talents to be used for others, they need prioritize educating gifted students on upright character and morals (case 209) It is important to develop individual ability but social cooperation and upright character should also be considered during the process (case 321)
Theme 7	Minor	18 (6.4%)	There is no room to accommodate gifted education in the public school system.	Gifted education in the public school system is unrealistic.(case 234) Realistically, gifted education in public schools is hard. There is no choice but to use government-run specialized facilities or private institutions.(case 317) Public education in Korea is difficult. A program on a national level should be administered…(case 436) The implementation of gifted education through a gifted institution (case 804) If gifted education is utilized for the purpose of improving the nation's economy, I disagree. Capitalism is creating tension between individuals

Table 9. *Inductively Developed Themes in Open-Ended Questions 2: "Please share any comments you may have about gifted education in Korea*

		and putting aside individual happiness by the individuals' being used as a tool (case 252)
Others	21 (7.5%)	Each specialized schools should fulfill its roles (case 363)
Total	282 (100.0%)	

Note: This data was translated from Korean responses.

CHAPTER 5

DISCUSSION

The purpose of this study was to investigate the perceptions of Korean elementary teachers related to giftedness and support for talent development. The reason that this study was necessary at this time is because of the following situation in Korean gifted education. First of all, because only 1.76% of the entire Korean student population had the opportunity to take part in gifted programs in 2012 (Korean Ministry of Education, 2013), many Korean gifted students face difficulties in obtaining an appropriate gifted education. Moreover, the majority of Korean gifted programs (83%) focused on the domains of mathematics and science (Korean Ministry of Education, 2013). Programs for the gifted in nonacademic domains, such as music and athletics, tended to be disregarded, comprising only 17% of all gifted programs in the country (Korean Ministry of Education, 2013).

In addition to these circumstances, the Korean Ministry of Education (2013) intended to introduce teachers' observations and recommendations as methods for identifying gifted students. However, there are still concerns about whether these identification methods are effective and reliable for several reasons (i.e., a lack of objective criteria; Choe & Park, 2004; Han & Lee, 2011; No, 2013). To succeed in using these methods, it is very important for teachers to have the accurate perceptions related to giftedness and support for talent development. Teachers' perceptions about these constructs can have a direct influence on how they identify gifted students (Davidson Institute, 2006; Huff, Houskamp, Watkins, Stanton, & Tavegia, 2005; Jun, Kim, Lee, & Park, 2013; Rist, 1996). Therefore, this study investigating the perceptions of Korean teachers regarding these constructs is very meaningful and timely. To better understand the current state of teachers' perceptions, the following two research questions were posed.

1. *What are the perceptions of Korean elementary teachers about giftedness in terms of talent development?*
2. *What perceptions do Korean elementary teachers have regarding teaching gifted students related to talent development?*

To answer the first research question, this study investigated whether Korean elementary teachers leaned more toward the traditional or the contemporary perception of giftedness. To look for answers to the second research question, this study examined the degree to which Korean teachers were willing to accommodate teaching practices and gifted services for gifted students' talent development. The Korean elementary teachers in this sample showed general trends of perception regarding the constructs of giftedness and talent development support, with only a few demographic differences (see Ch.4).

The following section is composed of four subsections. In the first, the perceptions of Korean elementary teachers as a full sample will be discussed. Secondly, the participants' overall perceptions in the individual items comprising TCGiftedness and TDS will be discussed in terms of the trends both in rankings and within thematic categories. This section will also address what these trends indicate with regard to the research questions. The third section will address the reasons why demographic groups formed according to four variables show different perceptions about these two constructs. These results will be connected to the research questions. In the final section, implications and recommendations for practices and future study in Korean gifted education will be provided based on the insight obtained from the preceding findings.

Korean Elementary Teachers' Perceptions Related to Giftedness

The two different approaches to gifted education -- the traditional gifted child approach and the contemporary talent development approach -- affect diverse aspects of gifted education (e.g., definition of giftedness, target students in gifted programs). Thus, it is critical to know whether teachers perceive giftedness in terms of the traditional gifted child or contemporary talent development approach. These two different philosophical orientations to gifted education result in different practices in the field. As a specific example, the approach on which teachers base their perceptions of giftedness can have an influence on the identification of gifted students. If a teacher has a traditional perception of giftedness, he or she will identify students with a high IQ or excellent achievement in all subjects as being gifted. As a result, many students will be excluded such as learners who are gifted in nonacademic domains but do not meet such conditions. On the contrary, a teacher with a contemporary perception of giftedness will allow more students opportunities to participate in gifted programs, because he or she perceives that a student showing giftedness in only one domain can be gifted.

Researchers have found that the incorrect perceptions of American teachers about the abilities of CLD students result in the underrepresentation of CLD students in gifted programs (Huff, Houskamp, Watkins, Stanton, & Tavegia, 2005; Rist, 1996). Research also indicates that Korean teachers have incorrect perceptions about giftedness (Jung et al., 2013; No, 2013). Thus, it is very important to further investigate Korean elementary teachers' actual perceptions about giftedness.

Perceptions in Terms of the Traditional and Contemporary Approaches Related to TCGiftedness

In this study, the construct of TCGiftedness shows the orientation of Korean elementary teachers' perceptions to fall between traditional giftedness and contemporary giftedness. Overall, the full sample in this study showed a score of 3.56 in TCGiftedness. Thus, the perceptions of participants in this study oriented more toward contemporary giftedness. Although overall they oriented more toward contemporary giftedness, the degree of the orientation of their perceptions was not drastically contemporary. This implied that participants' perceptions showed a mixture of traditional and contemporary perceptions of giftedness.

The reasons why Korean elementary teachers in this study showed such orientation of perceptions related to TCGiftedness may be interpreted as follows. Most of all, the efforts that the Korean government has made may have contributed to Korean elementary teachers' having perceptions that leaned more toward the contemporary approach. Announcing the comprehensive plan for gifted education every five years since 2002, the Korean government has evaluated the previous comprehensive plan and made the new plan based on the obtained results (Park, 2013). In addition, the Korean government has enforced the "Law for Improving Gifted Education" since 2001, for the purpose of developing students' potential to the highest level and contributing to improving the country's competency.

In particular, an enforcement ordinance followed by the law particularly emphasized the enhancement of gifted teachers' professional quality and the improvement of teachers' understanding about gifted education. As one example, it prescribes that teachers who take part in professional development related to gifted education for a determined amount of time can be gifted teachers. In addition, it prescribes those professionals in specific fields who do not have a certificate as a teacher can be in charge of gifted education if they meet specific qualifications. This law and the enforcement ordinance prescribe that the government should regularly implement professional development for gifted teachers (Park, 2013).

However, as the previous sections showed, Park (2013) maintains that the system to educate, train, and allocate general teachers into gifted teachers was not systematic. Additionally, professional development does not greatly expand for general teachers although the third comprehensive plan tries to introduce teachers' observations and recommendations as this study showed. Thus, a majority of general teachers do not have the opportunity to participate in professional development related to gifted education. It is possible to interpret that this situation may prevent these elementary teachers' perceptions from moving more toward the contemporary approach.

Korean Elementary Teachers' General Perceptions in Terms of Traditional and Contemporary Giftedness

Meaningful implications and insights were explored based on findings about two trends present both in ranking order and within thematic categories in individual items consisting of TCGiftedness,. That is, the following section will address why participants show such general perceptions both in ranking order and within thematic categories and what the implications are.

The general trends of Korean elementary teachers' perceptions through ranking order. The following two trends of participants' perceptions were found: First, participants demonstrated dissimilar rankings overall by showing their conflicting views on individual items that related to one topic. Second, there were trends showing that perceptions about the necessity for gifted students' talent development based on the context of Korean education may have contributed to such rankings.

The conflicting views in individual items regarding the same topic. First of all, although they perceived that students with high ability in one domain are gifted, the reasons why participants showed the conflicting perceptions according to specific domains can be explored in terms of diverse aspects. For example, the disparity between the provision of gifted programs in academic versus nonacademic domains may be one important reason (Korean Ministry of Education, 2013). Because there are more gifted programs, teachers are familiar with such academic giftedness. As a result, they can show higher perceptions about such domains. Also, both the value system of Korean society and Korean parents' perceptions that put more value on high academic abilities cannot be disregarded. Because these conflicting perceptions related to domain-specific giftedness can be a concern in identifying gifted students, it is necessary for the government to take such diverse measures as educating teachers and providing more gifted programs for nonacademic domains.

Also, participants showed conflicting perceptions in relation to the roles of psychosocial factors and innate abilities. Participants highly agreed that psychosocial factors are more important than innate abilities in accomplishing high achievement. Although success in the professional field is considered a kind of high achievement, they did not show high agreement with the statement that psychosocial factors are more important than innate abilities. On the contrary, literature maintains that accomplishing eminence requires psychosocial skills and strengths (Simonton, 2000; Subotnik & Jarvin, 2005). Thus, Korean elementary teachers, including these participants, need to pay more attention to developing students' psychosocial skills and abilities through diverse strategies such as counseling or training programs.

The consideration of the necessity for gifted students' talent development within Korean educational context. The reasons why participants showed almost the highest ranking regarding enjoyable involvement in the talent development process can be diverse (e.g., to develop students' motivation or to have time of exploration). However, in the Korean educational context, it cannot be disregarded that this outcome may be due to the students' participation in private education against their will or interest. This is because teachers perceive the situation that many students are forced to receive private education after school rather than enjoyably explore diverse activities for their talent development due to diverse reasons (i.e., parents' expectations and pressure). Thus, this theme is the second most frequently commented by participants in response to open-ended question 2. In particular, in Korea, gifted education has been criticized as a main factor driving private education along with parents' strong desire to want their children to become gifted.

However, before criticizing parents' strong desire or the elitism of gifted education, it is necessary for the government to consider why private education is thriving. Although there are many reasons for the prosperity of private education, the fact that the equalization of education is more emphasized may be a main one. Thus, measures for more flexible and diverse education in public schools (e.g., differentiation teaching strategies, diverse learning levels and the provision of gifted programs in more diverse domains) may need to be taken. In addition, as the outcome of the development of creativity through training programs shows, the Korean government's proactive its communication about gifted education can be very influential in forming teachers' perceptions. Thus, the government's plans, such as the Third Comprehensive Plan for Improvement of Gifted Education (Korean Ministry of Education, 2013) should be communicated and explained more positively to teachers.

The general trends of Korean elementary teachers' perceptions within thematic categories. Another approach investigated what trends participants' perceptions have within thematic categories that grouped survey items with similar themes. As a result, in the following thematic categories, participants showed common perceptions. Though their perceptions, meaningful implications could be understood.

Korean elementary teachers' perceptions about high achievement and high IQ. Firstly, Korean elementary teachers generally oriented more toward contemporary perceptions regarding gifted students' high achievement in all subjects (Figure 2). However, these participants leaned more toward the traditional perception of IQ, perceiving that students who have a high IQ over 130 are gifted. Winner (1996) regards the assumption that gifted students show high achievement in all subjects as a representative "myth" about giftedness (p.7). She maintains that people perceive that gifted children's general intellectual power allows them to become gifted across fields. She refers to this as the myth of global giftedness. She also indicates that the belief that all gifted children have an exceptional IQ is a myth. She contends that there is little evidence that giftedness in nonacademic talents, such as music, art, and athletics, demands an exceptional IQ. Thus, if Korean elementary teachers believe in such myths, they may exclude many gifted students with diverse talents. For this reason, they need to have the contemporary perceptions related to high achievement and IQ. However, because participants oriented slightly toward the traditional perception regarding high IQ, quite a few teachers (around 40.0%) perceived that students who have high IQ over 130 are gifted. These participants' perceptions may be associated with the belief that giftedness is connected with high IQ, a belief strongly ingrained in the minds of the public and educational professionals across South Korea.

However, this result particularly conflicts with the policy implemented in Seoul's public schools. In identifying gifted students, the Seoul Metropolitan Office of Education does not employ an IQ test as an identification method. Thus, a majority of participants (*N* =820) did not select the item stating that the IQ test is used as an identification method. Nonetheless, quite a few respondents (44.7%) agreed or strongly agreed that gifted students should have a high IQ. This shows that the decided policy related to gifted education did not strongly affect the actual perceptions of the people concerned.

As another example of the limits of the policy in influencing teachers' perceptions, Gagné (2007) recommends that school administrators and gifted program coordinators should expand their selection ratio by revising the restrictive 5% rule. The Korean government is also trying to follow recommendations by expanding opportunities for more students to participate in gifted programs. Only 1.76% of the entire Korean student population, who are selected through different identification methods according to districts or schools (e.g., teachers' recommendation and observation, creativity tests, or performance assessment), obtained opportunities to participate in gifted programs in 2012. Therefore, the new comprehensive plan for gifted education attempts to include more students (Korean Ministry of Education, 2013).

However, in their responses to the open-ended questions, some teachers indicated the perception that gifted programs should be provided to fewer selected students. For instance, one teacher commented that "Korea's gifted education is being administered to too many students. The actual percent of gifted children is under 1%, but the term is too widely applied" (case 344). Another teacher criticized the expansion of the criteria for giftedness, suggesting that "...the government should make an institution for educating only 0.01% of gifted students…" (case 275). Also, the previous studies showed Korean teachers tended to perceive a very narrow segment of the student population as gifted (Choe & Park, 2004; Hwang & Kim, 2009; Jung et al., 2013). For example, Hwang and Kim (2009) investigated the perceptions of 266 science teachers in science magnet schools, after-school gifted science education academies, and regular schools regarding what percentage of students should be identified as gifted. As a result, 41.4% of all participants responded that the upper 1% of the student population should be selected as gifted science students. Thus, in addition to announcing policy, the Korean government needs to employ diverse methods (e.g., communicating and implementing professional development to explain the purpose of the gifted education policy) to change teachers' perceptions.

Korean elementary teachers' perceptions about domain-specific giftedness. Secondly, Korean elementary teachers in this study overall oriented more toward a contemporary perception in relation to domain-specific giftedness (see Figure 2). The traditional approach implies that gifted students have reasoning abilities that allow them to show high performance across all academic domains. The TDMM (2011), as the talent development approach, emphasizes domain-specific abilities as well as general abilities in developing students' giftedness and talents. Participants showed relatively very high averages in response to the statement that students showing excellent ability in one domain are gifted (Figure 2). On the contrary, teachers' perceptions according to a specific domain were different. Korean elementary teachers in this study showed higher averages in response to the statement that students with a high ability in math and spatial intelligence are gifted than they did to students with a high ability in language or other nonacademic domains such as leadership (Figure 2).

This perception is likely to reflect the situation of Korean gifted education. As chapter 1 explains, the majority of Korean gifted programs (83%) are associated with the domains of mathematics and science, while there are relatively few gifted programs (17%) in other domains (Korean Ministry of Education, 2013). This situation can lead teachers to be more familiar with giftedness in math and science (i.e., spatial domain) than in other areas (e.g., leadership or drama). Consequently, this environment predisposes teachers to emphasize academic domains, such as math and science, in their identification.

This perception held by Korean elementary teachers can create considerable problems in identifying gifted students in the classroom. The new plan is gradually introducing the teachers' judgment to find students' hidden talents or potential (Korean Ministry of Education, 2013). However, only around 50% of these participants agreed or strongly agreed with the statement that students with high abilities in leadership are gifted (Appendix G). If it is assumed that the teachers who participated in this study identified students in their classrooms as gifted, it is possible that around 50% of Korean elementary teachers would not identify students with leadership as gifted.

In Han and Lee's (2011) study, the gifted teachers perceived that fairness and professional knowledge are the most critical factors for successfully using observation and recommendation as identification methods. As the result of the present study shows, around 80% of teachers perceived that students with giftedness in only one domain are gifted. However, not all of them would identify students with talents in nonacademic domains as gifted. This narrow perception of giftedness is not beneficial to students with giftedness in such domains. This implies that it is necessary to have appropriate professional development in order to improve teachers' perceptions and to connect those changed perceptions with practices. Also, it is necessary for the government to create appropriate criteria and methods to more effectively employ observation and recommendation for the purpose of identifying gifted students in more diverse domains (Han & Lee, 2011).

Korean elementary teachers' perceptions about fixed intelligence and the malleability of creativity. The third trend is that the Korean elementary teachers in this study oriented more overall toward contemporary perceptions in relation to the development of creativity. In other words, participants showed high averages of agreement in statement about the development of creativity through training, as indicated in Figure 2 and Appendix G. Regarding whether creativity is malleable, Runco (2004) has explained creativity as a syndrome or complex, stressing its complicated and changeable nature. Also, Cramond and Kim (2008) maintain that due to the dynamic and general feature of creativity, it is possible to develop creativity training programs for all students, not just gifted students with excellent creativity. Additionally, they contend that it is necessary to nurture creative thinking in all areas of one's life due to the malleability of creativity. Thus, the perception of Korean elementary teachers about the development of creativity is appropriate.

The fact that Korean elementary teachers perceived creativity as malleable may be explained by the impact of the government's communication about policy. As the new comprehensive plan for gifted education (Korean Ministry of Education, 2013) stresses, the implementation of creativity training programs is one of the most emphasized areas in Korean gifted education. This may influence teachers' agreement with the concept of developing creativity. In the literature, the TDMM (2011) stresses the nurturing of creative thinking. Because creativity is one of the most important features in transitioning from ability to eminence during talent development, creativity should be deliberately nurtured using diverse strategies (e.g., divergent thinking or creative problem solving).

An orientation toward a contemporary view of giftedness includes a malleable view of intelligence. Although many participants leaned more toward the contemporary perceptions of intelligence, around 20.0 % of participants agreed or strongly agreed with the statement that intelligence cannot be changed. The interpretation of this result is related to Wu's (2005) pilot study exploring Chinese teachers' perceptions about talented students. He maintained that Western-based research explains the focus of talent development as moving from nature -- emphasizing innate abilities such as intelligence - to a mixture of nature and nurture -- stressing non-innate abilities such as effort. On the contrary, Chinese-based research underscores that the point of talent performance moves from nurture into a mixture of nature and nurture. He reports that most of the interviewees (14 secondary teachers) in his study believed that students' innate abilities are not as important as nongenetic factors such as diligence. He explained that this difference is due to the two different cultural backgrounds.

Dweck (1975, 2000) explained why it is important not to perceive intelligence as fixed. She distinguished between a fixed mind-set, which regards intelligence as a fixed and innate characteristic, and a growth mind-set, which views intelligence as malleable. She maintained that people with a fixed-mindset make as little effort as possible because they generally believe that there is little they can do to enhance their innate abilities. However, people who have a growth-mindset regard challenges and difficulties as part of the process of reaching higher achievement. Those with a fixed-mindset will not encourage students to develop their innate abilities because they perceive that students can do little to change them. Thus, it is necessary for participants who still view intelligence as fixed to orient more toward contemporary perceptions that consider intelligence malleable.

Korean elementary teachers' perceptions about psychosocial factors. In addition, Korean elementary teachers in this sample showed higher averages of agreement with the statement that motivation is more important than IQ in achieving highly (see Figure 2). They demonstrated more contemporary giftedness regarding high achievement by emphasizing the role of psychosocial factors. In contrast, they demonstrated lower averages of agreement for the statement that success in a professional field is due more to psychosocial factors than innate abilities (Figure 2). This means that they leaned less toward the contemporary perception regarding accomplishing success in a professional field by stressing innate abilities than they did concerning high achievement.

This perception is mentioned in teachers' comment in response to the open-ended questions. For example, many teachers emphasized gifted students' innate abilities in their comments. One teacher noted that "Korea's gifted education is instructing gifted students who were forced to learn advanced knowledge and skills. I hope that Korea will find and instruct innately gifted children" (case 8). Another teacher noticed that "There still tends to be more gifted students made with forced instruction than innately gifted students" (case 138). Consequently, teachers perceived the role of innate abilities as being important in demonstrating giftedness, although there are quite a few cases in which students become gifted through parents' excessive involvement and pressure in the Korea. One teacher confirmed this point, suggesting that "Gifted students are students with the potential for giftedness that have been polished rather than students that have been forced to be gifted by excessive involvement in training" (case 325).

Previous research emphasizes innate abilities as well as the talent development process in expressing giftedness. For example, in the DMGT, Gagné (2007) differentiates between systematically developed skills (talents) and natural abilities (gifts), and stresses the transformation of natural gifts into high-level expertise or mastery in a domain. However, he maintains that the minimum threshold for any type of gift or talent should be set at the 90th percentile. In other words, he argues that students who belong to the top 10% of the reference group in terms of their natural abilities or systematically honed skills deserve the label of gifted. Thus, he stresses innate abilities as well as the development process to nurture talents. Also, Subotnik et al. (2011) claim that general ability is a necessary component of talent development, but it is not sufficient to accomplish optimal achievement, because additional factors such as learning and practice are required.

One concern with the traditional approach is that it exclusively focuses on innate abilities and places less emphasis on psychosocial factors. However, the literature explains that gifted learners identified during childhood do not always become eminent adults, despite the exceptions (Subotnik, 2009; VanTassel-Baska, 1989). Also, students with high IQs who received good education did not perform beyond what might be expected from their high abilities (Subotnik, 2003; VanTassel-Baska, 1989). Thus, the talent development approach more emphasizes the role of psychosocial variables, such as motivation or perseverance, more than innate abilities as a determining factor in successfully accomplishing talent development (Subotnik et al., 2011). Consequently, it is necessary for Korean teachers to put more emphasis on psychosocial factors to successfully develop students' innate abilities.

Korean elementary teachers' perceptions about finding talents and developing giftedness. Finally, Korean teachers oriented more toward contemporary perceptions with regard to finding nonacademic talents. That is, they showed relatively high trends for the idea that enjoyable involvement in a domain is more important than developing skills, as seen in Figure 2. These perceptions reflect the Korean educational circumstances. A majority of Korean elementary students (80.9%) receive out-of-school private education and parents' desire for their children to be gifted are considerably strong (Choe, 2008; Lee, 2014). Therefore, teachers worry about these parents' excessive involvement and obsessive aspiration for their children to learn successfully may burden their children and prevent them from being enjoyably involved in a domain.

In this study, many teachers voiced such concerns. For example, one teacher argued that "There is too much parental involvement" (case 200). Another teacher similarly mentioned that "...Students need to feel joy in learning through a curriculum based on their levels, and students should not be forced through gifted education just for boosting parents' egos through their children being gifted..."(case 230). Another teacher pointed out that "Parents are imposing their desires to have a special child on private education..." (case 312). By constituting the second most frequently commented theme in Table 9, with over 19.5% of responses, these comments explicitly showed the common perceptions of participants. As a result, if gifted students focus on developing skills from the first stage of talent development, and are not enjoyably involved in a domain, there could be detrimental consequences. For example, students might be forced into excessive practices through private education to obtain excellent skills. Thus, it may be interpreted that these teachers support enjoyable involvement rather than developing skills in a domain.

This issue is also reflected in Kim's (2013) study investigating Korean teachers' perceptions of music talent development. The teachers of her studies believed that, although parents are very important in developing musical giftedness, the excessive interest and intervention of parents prevent gifted students from developing their talent. Also, extreme emphasis on performance technique hinders the recognition of gifted students' potential. These music teachers' perceptions explicitly explain the reasons why teachers in this study supported enjoyable involvement rather than developing skills in a domain. Subotnik et al. (2011) suggest that at the earliest stage of talent development, it is recommended for educators, coaches and parents to encourage gifted students to be involved in a specific domain or topic. This involvement should be enjoyable and increase gifted students' motivation. Then, in the next stage, expert teachers can proceed to hone gifted students' needed skills and knowledge to develop expertise.

In developing giftedness beyond finding students' talents, participants oriented slightly toward contemporary perceptions about the statement that students should focus on learning and practicing in a specialized domain as soon as possible (Figure 2); A considerable number of teachers (56.2%) disagreed or strongly disagreed with this statement. However, some Korean elementary teachers (20.9%) still maintained traditional perceptions by agreeing or strongly agreeing with this statement.

Regarding this issue, the TDMM (2011) emphasizes that there are different starts, peaks, and endings in performance trajectories among and within domains. Therefore, it is important to know how the process of talent development differs by field. That is, according to the field, talent development is affected by when physical maturation happens and by when the skills and abilities in the talent area appear and coalesce. For example, in athletics, gymnastics starts during childhood with early specialization, but track starts during early adolescence. Also, in academic domains, the development of talent in math starts during childhood. However, because some areas such as religion or literature require the build-up of maturity and experience to make a contribution to the field, their talent development trajectories generally start during late adolescence. Thus, the model contends that assessments for identifying giftedness should begin with young children, but should be successive and systematic throughout early and middle childhood and adolescence. Consequently, Korean teachers should be aware of the time of entry into that field and should not focus merely on developing their talents as soon as possible regardless of the field. This is because it is very important to systematically and effectively develop talents according to each field.

Differences in Perceptions among Demographic Groups in terms of the Traditional and Contemporary Approaches Giftedness

Korean elementary teachers showed general and common perceptions about survey items related to TCGiftedness. However, the perceptions of Korean elementary teachers among demographic groups showed differences regarding whether the demographic groups leaned more toward the traditional or contemporary giftedness. The following section will discuss how Korean elementary teachers' perceptions differ according to the demographic variables listed previously in Chapter 4.

Upper and lower grade teachers. Korean elementary teachers from the upper elementary grades showed more contemporary views of giftedness than did teachers from the lower grades. That is, the teachers from upper elementary grades showed a higher mean score in the construct of TCGiftedness, which means that the perceptions of the upper grade teachers leaned more overall toward contemporary giftedness than did the perceptions of the lower grade teachers. Also, this means that the upper grade teachers overall showed a higher rate of agreement in survey items comprising

TCGiftedness. That is, the higher the score a respondent showed, the more contemporary a perception of giftedness he or she showed. These results imply critical points in terms of Korean gifted education practices. As the previous section explains, the basis for a teacher's perceptions of giftedness can influence his or her judgment and decision in relation to giftedness. For example, because the upper grade teachers have a more contemporary perception of giftedness, they are more likely to identify students with talents in diverse domains such as leadership and language as gifted.

In addition, as Han and Lee's (2011) study suggests, the opportunity for students to receive gifted education is influenced by teachers' professional knowledge. A lack of knowledge about identifying giftedness in a specific domain may be detrimental to gifted students because it could prevent them from having opportunities to develop their talents. The TDMM (2011) emphasizes that opportunities should be provided to students and utilized by them. Thus, it would be beneficial to understand why the lower grade teachers leaned less toward the contemporary approach, because the differences in two grade groups' perceptions may influence gifted students' talent development. Based on such understanding, if necessary, the government should implement professional development to improve the perceptions of lower grade teachers.

Also, the contemporary perceptions related to giftedness put more emphasis on the role of psychosocial factors (i.e., motivation) in developing talents. Thus, it is possible that the upper grade teachers with more contemporary giftedness are more likely to place more emphasis on psychosocial factors. The TDMM (2011) underscores the role of psychosocial factors in developing gifted students' talents. The model maintains that the talent development process can be hindered or accelerated by psychosocial skills. For instance, weak psychological strength, low motivation, and a fixed-mindset causing a lack of resilience in the face of failure can all hinder the talent development process. On the contrary, strong psychosocial skills, optimal motivation, and growth mindsets can accelerate the process. Jarvin and Subotnik (2010) maintain that one of the functions of a good teacher in developing students' talents is to provide students with knowledge in a specific domain and also appropriate training related to psychosocial factors. Thus, if through further study, the lower grade teachers put less emphasis on psychosocial factors, it is necessary to educate them about the important role that psychosocial factors play in talent development.

Years of teaching experience. The Korean elementary teachers in this study with 1-3 years of teaching experience held the most contemporary views of giftedness, showing a mean score of 3.64 for TCGiftedness. However, a majority of the teachers in this group, those with over 13 years of teaching experience leaned relatively less toward contemporary views of giftedness, indicating a mean score of 3.52 for TCGiftedness. There were statistically significant differences in the perceptions of these two groups. The Korean elementary teachers with the fewest years of teaching experience had more contemporary perceptions in the following components of the TCGiftedness construct: (a) the roles of achievement and IQ in identifying giftedness; (b) giftedness in each domain; (c) fixed intelligence; (d) the development of creativity; and (d) enjoyable involvement in finding nonacademic talents.

Regarding the two groups' significantly different perceptions, it can be speculated that the reason for these differences can be related to the context in which Korean gifted education has been implemented. As the previous section explains, Park (2013) maintains that the Korean government attempted to enhance the quality of teachers by enacting the first gifted education law in 2001 and the first comprehensive plan for gifted education since 2002. However, the strategies to train general teachers to become gifted teachers were not conducted efficiently. Moreover, Chapter 4 explicitly shows that few Korean elementary teachers have opportunities to take part in professional development

Based on this context, one possible explanation for why Korean elementary teachers with more than 13 years of teaching experience leaned relatively less toward contemporary views of giftedness can be interpreted as follows. They have had fewer opportunities to become informed and educated about gifted education, because the Korean government did not actively implement gifted education until 2003. This might have contributed to teachers with more than 13 years of teaching experience having less contemporary perceptions about giftedness, compared with teachers with 1-3 years of teaching experience. However, the differences in their perceptions were somewhat small, as the Effect Size (ES= 0.32) shows. As this study conducted in 2014 explicitly showed, the more serious concern was that Korean elementary teachers still have few opportunities to participate in professional development related to gifted education. In order to fully understand the cause of this result, future research is needed to identify the source of differences.

Participation in the professional development. Korean elementary teachers who took part in this study showed statistically significant differences in their perceptions related to giftedness according to their participation in professional development. The perception of teachers with professional development oriented more toward contemporary giftedness. This group showed more of an orientation toward contemporary giftedness in its perception by demonstrating their agreement in almost all survey questions indicating contemporary giftedness, compared with its counterpart.

Although the variable of professional development can influence the differences in teachers' perceptions, the result of this survey clearly shows that Korean elementary teachers infrequently have access to professional development. In this survey, the ratio of teachers with professional development to teachers without professional development explicitly demonstrates this issue. The group size (N=197) of participants with experience in professional development was smaller than the group size (N= 636) of participants without experience in professional development. Thus, the number of participants in these two groups conveys an important point: Many teachers did not take part in professional development related to gifted education for many reasons. For example, they may not have had the opportunity to take part in professional development or they may have chosen not to participate although the opportunity was offered to them. Demographic information about professional development in Chapter 4 explicitly demonstrates this point.

The necessity of teachers' participation in professional development was evident in the teachers' responses to the open-ended questions. For example, one teacher suggested that "Teachers should be given in-depth training in order for content-related capacity to be increased…" (case 226). Additionally, another teacher mentioned this necessity, maintaining that "It would be good if there were more systematic programs for developing teachers professionally. There is a lack of teaching material to provide to the students" (case 292). Although the main objective of the new comprehensive plan for gifted education (Korean Ministry of Education, 2013) aims to improve gifted teachers' professional quality and ability, these results related to professional development imply that the accomplishment of this objective may not be possible among these elementary school teachers. Thus, it is very important for the government to expand the opportunities of professional development for Korean elementary teachers. In particular, despite the fact that only one quarter of respondents had participated in professional development, this group of teachers showed statistically significant differences in perception although the effect size was not large. This suggests that if more teachers take part in professional development, it could positively affect their perceptions related to giftedness.

The presence of gifted programs in the school. The perceptions of Korean elementary teachers according to the presence of gifted programs in their schools were investigated. As a result, teachers without knowledge about gifted programs in the school showed significantly different perceptions from those of the other two groups with or without gifted programs in the school (Table 5). This implies that the existence of gifted programs in the schools did not have much influence on teachers' perceptions about giftedness. The group without knowledge about gifted programs leaned less toward the contemporary approach to giftedness than the other two groups did. In addition, difference between the effect sizes of the group with no knowledge and the group with gifted programs or the group with no knowledge and the group without gifted programs was not considerable small (Table 5). In other words, they showed low rates of agreement with almost all items indicating contemporary giftedness (e.g., domain-specific giftedness, the development of creativity, and psychosocial factors).

Teachers may learn about giftedness and gifted programs in the school through diverse methods, such as workshops. However, a surprising percentage of teachers (32.7%) did not know whether their school had implemented gifted programs. This brings up the concern of possible communication problems with gifted education administration in Seoul public schools. This point also appeared in teachers' comments. One teacher noted that, "There is a lack of general teachers' perceptions about the necessity of gifted education" (case 180). Another teacher asked for "a chance…to build a professional plan for gifted education (persistent administration)" (case 233). Also, one teacher criticized the implementation of gifted education, suggesting that, "Because of superficial implementation of gifted education, there are many cases where the implementation degraded into name-only programs early on" (case 402).

The lack of teachers' knowledge about the presence of gifted programs was associated with the less contemporary orientation. The more serious concern is that such ignorance about gifted programs can affect teachers' judgment in identifying gifted students using observation and recommendation. As Chapter 4 describes, 57% of teachers and 41.1% of teachers respectively used teacher observation and recommendation as identification methods. Thus, it is necessary for the government to ensure that teachers have correct knowledge about giftedness and gifted programs.

Korean Elementary Teachers' Perceptions Related to Talent Development Support

As the previous section in Chapter 2 describes, two approaches have explained how gifted students' excellent talents should be supported. The gifted child approach emphasizes that gifted programming should be uniquely suited to fit the characteristics of gifted children. On the contrary, the talent development approach emphasizes that gifted students should be provided with in-depth experiences related to their interests and strengths in specific domains to promote more serious pursuit of their interests. Also, this approach positively encourages students to take part in out-of- school activities, such as talent search programs and mentorship with experts (Dai

& Chen, 2013). Consequently, both approaches suggest that diverse accommodation in terms of practices or programs to meet gifted students' learning needs should be offered in order to develop their outstanding talents. These findings from Chapter 2 provide a theoretical background for the investigation of the perceptions of Korean teachers related to support for talent development.

A Full Sample's Perceptions Related to Talent Development Support

The mean score of TDS of a full sample was 3.49 and the degree of accommodation for gifted students' talent development was not drastically high. This result may be due to the fact that it is not easy to implement gifted programs in the general public schools. Park (2013) explains that gifted education for elementary students is actually implemented in gifted centers within district offices of education and universities rather than in regular public schools. Moreover, because only 1.76% of the entire student population participates in gifted programs, these institutions play more important roles in educating gifted elementary students than general public schools. However, this current situation should be improved. More students with diverse talents should be able to have opportunities to find and develop their potential in general public schools as well as in these out-of-school institutions. To do so, it is necessary to establish infrastructure such as personnel, resources and facilities in public schools so that gifted programs can be implemented. In addition, teaching strategies and skills commonly used in gifted education need to be provided to teachers. If continual efforts are made in terms of these aspects, the perceptions of Korean elementary teachers related to support for the accommodation of teaching practices for students' talent development will likely be improved.

Korean Elementary Teachers' Trends of General Perceptions of Talent Development Support

In relation to individual items consisting of TDS, two trends were explored. Firstly, the general trends of individual items related to TDS through ranking order were investigated. The following section will address the reasons why participants showed higher rankings for some teaching practices while they showed relatively lower rankings for other practices. From these findings, meaningful implications and insights will be drawn. Secondly, the trends within groups that are divided thematically were studied. The following section will address why they showed such similar perceptions in practices and gifted services included under the same thematic categories (e.g., practices for academic talent development or practices for nonacademic talent development). Also, the meaning of these perceptions related to Korean gifted education will be discussed.

The general trends of Korean elementary teachers' perceptions obtained through ranking order. Participants in this study showed the following three trends. These trends explain why participants showed relatively higher rankings in some practices, but relatively lower rankings in others.

The high necessity for the practices and services. Korean elementary teachers in this study showed the highest ranking in ten services of the 13 services listed in Part 8 of the survey (e.g., field trip, mentorship, and after-school programs in more diverse). It may be possible to interpret that Korean elementary teachers in this study perceive that these gifted services are highly necessary and beneficial to gifted students' talent development regardless of whether they are currently implemented now or can potentially be implemented later. Moreover, the fact that among practices during regular school hours, pull-out programs and teaching strategies to elicit high-level thinking were included in the highest ranking group, while other practices during regular school hours showed relatively lower ranking confirms this point.

In the most important theme of open-ended question 2, many teachers (23.4%) contended that it is necessary for Korean gifted education to implement more systematic gifted programs and to create an environment for implementing appropriate gifted education. For example, one teacher maintains that "There needs to be a systematic and diverse gifted educational curriculum… (case 165)." In addition, another teacher contended that "It would be good if gifted education systems were operated more systematically and if more experts could have a chance to teach students" (case 199). Also, in theme 7, some teachers suggested that there is no room to accommodate gifted education in the public school system in Korea. These comments indicate that these two practices may be difficult to implement during regular school hours in the actual classroom. However, participants showed the highest rankings for these practices because they perceived that these are highly necessary and required for gifted students.

In particular, although training programs for psychosocial skills and pull-out programs are rarely implemented in Korean public schools, these services and practices were included in the highest ranking group. In relation to training programs for psychosocial skills, participants showed very appropriate perceptions according to the literature. Jarvin and Subotnik (2010) maintain that the type and relative emphasis of diverse psychosocial skills that are required for developmental transition from abilities to eminence differ. Moreover, research contends that accomplishing eminence requires strength and psychosocial skills (Simonton, 2000; Subotnik & Jarvin, 2005). Thus, appropriate psychosocial training is required to accomplish successful talent development. The government could obtain the following implication from these results. If the Korean government made more efforts to create a more favorable environment for implementing the gifted services that received the highest rankings, one may predict more positive results regarding the implementation of these gifted services and practices. This is because Korean elementary teachers showed favorable perceptions concerning the accommodation of these services and practices.

The important consideration of limitations or prerequisites in implementation. There was a trend that when limitations (e.g., feasibility and practicality in implementing the services and practices) or prerequisites (i.e., the equipment of the system) or both should be importantly considered along with practices and gifted services for gifted students' talent development, these practices' rankings were lower. Most of all, online learning requires infrastructure such as an appropriate computer system and online programs. Without such resources, its feasibility decreases. Also, the assignment of different homework and grouping by ability may go against the belief system as well as the educational philosophy of equalization of education in South Korea. Thus, it is possible for stakeholders such as parents and community members to strongly oppose the implementation of such practices in the public schools. Like in the U.S. (Davis & Rimm, 2004), gifted education in South Korea has been criticized as elitism. This criticism and opposition may limit the implementation of these practices.

In addition, these practices (e.g., grouping by interest, assignment of enrichment, and the increased participation in nonacademic after-school programs for daily challenges) require many additional prerequisites such as facilities, personnel, learning resources and funding. Thus, participants showed lower rankings for these practices. Another possible reason for the lower ranking may be that participants might be worried that, because they have no experience in implementing such practices in the regular classroom setting, the practices could cause confusion in managing the classroom. This contrasts with the perceptions about pull-out programs, which were included in the highest ranking group. Although pull-out programs require similar infrastructure, participants showed relatively higher ranking for these practices. It is possible to speculate that for pull-out programs, participants prioritized necessity over limitations and prerequisites. To understand why they show such perceptions more clearly, it is necessary to conduct additional research in the future.

The consideration of large changes and negative consequences of implementation. Gifted practices and services that require large changes in the current educational system or that may bring significantly negative consequences after implementation showed the lowest rankings. Systematic programs for nonacademic talent development during regular hours, the elimination of mastered curriculum, and lessons for creativity within regular curriculum are practices and gifted services that may require considerable changes in the current Korean public school system. As Choe (2008) describes, one cannot deny that Korean schools still put more emphasis on raising academic test scores. Thus, without the large changes in terms of diverse aspects such as curriculum, class schedules, personnel, and facilities, it is not easy to implement nonacademic talent programs during regular school hours or programs for developing creativity within the regular curriculum. In addition, as Fullan (2007) pointed out, diverse factors such as the resistance of existing groups in leading such changes may be associated with these practices' low rankings.

Also, the curriculum compacting, free programs for all students, and the early start formal identification are practices that may be in the lowest ranked group due to their negative consequences. If public schools had implemented the curriculum compacting or started the formal identification earlier, they may have been connected with more thriving private education. The main reason why Korean elementary students receive private education is that they intend to learn contents from grades above their own in advance. Thus, if public schools implement curriculum compacting and earlier formal identification, they cannot exclude the possibility that it could lead to more demands on private education in order for students to be selected as gifted. Thus, because teachers may worry about such negative consequences, these practices may be included in the lowest ranking group.

However, in relation to these results, there is an opposite position that because public schools implement the same curriculum, text books and learning levels without employing differentiation practices, students cannot meet their needs in the public schools. Due to this, private education is thriving. In that case, there are other reasons why participants showed such rankings related to these practices. To understand why Korean elementary teachers in this study showed such perceptions about curriculum compacting and early formal identification more clearly, future research is necessary. Also, in implementing free programs for all students' nonacademic talent development, it is possible to interpret that participants might worry about the negative consequences in terms of diverse aspects such as budget. The fact that the Seoul public schools creates many controversies related to negative consequences in diverse aspects (i.e., cost) by providing free lunch for all students shows a similar point.

Korean elementary teachers' general perceptions related to TDS within thematic categories. The following section will discuss why participants showed similar perceptions among individual items included in the same thematic category. Also, this section will address what these perceptions imply for Korean gifted education.

The early start of formal identification. First of all, Korean elementary teachers did not show high averages in the early start of formal identification (Figure 2). As explained previously, this reflects concerns about excessive private education in Korea. Based on teachers' comments, it appears that teachers are worried that this practice may cause the start of a vicious cycle. Namely, if the government starts formal identification as soon as possible, the policy of early identification in public education will cause parents to put their children in private education at even younger ages. This practice can increase the demand of private education and may have a detrimental impact on public education. Thus, this may explain why a majority of teachers (around 69.0%) do not support this practice.

Many teachers mentioned this point in open-ended question 2. For example, one teacher mentioned that "With the boom in gifted education, everyone wants to be gifted, and I think receiving private education in order to get into a gifted class should be rejected" (case 325). Also, another teacher criticized the prosperity of private education due to the implementation of gifted education, saying that "Korea's gifted education is an extension of private education rather than authentic gifted education" (case 272). Moreover, one teacher deplored the reality that "Korea's gifted education is identifying students who have received private education instead of identifying innately gifted students" (case 324). Consequently, they were mostly worried that the activation of gifted education might be connected with the prosperity of private education to produce a gifted child shaped by excessive practices and training against their will or interest.

The support for teaching practices for academic talent development. Korean elementary teachers showed two common trends regarding teaching practices in academic talent development. First, they did not show higher trends for the practices during regular school hours, such as the assignment of different homework, the assignment of enrichment work, and creativity training within the regular curriculum as seen in Figures 4. For example, the lower averages for the assignment of enrichment work within the regular classroom reflects one teacher's concern that, "There need to be facilities that gifted students can show an interest in. How could a normal classroom teach gifted students creatively?...There needs to be a special classroom with experimental materials, craft supplies, and tools for scientific education" (case 226).

In particular, Korean elementary teachers did not demonstrate high averages of agreement for differentiation practices (e.g., the assignment of enrichment work or different homework during regular school hours) as shown in Figure 7. However, according to the literature, the differentiation practices offer educational services that cater to gifted students' advanced learning needs (Dai &Chen, 2013). Also, these practices have the potential to work in the regular classroom setting within the school system, considering students' strengths, interests, and styles (Dai &Chen, 2013; Tomlinson. 2008). Nonetheless, Korean elementary teachers showed relatively low averages in these differentiation practices. Only the assignment of different homework showed a higher average than those of the other two differentiation practices -- the elimination of mastered curricular materials and the assignment of enrichment work (Table 7). One interpretation of this is that the assignment of different homework is a less radical approach, compared with curriculum compacting in which contents already mastered are eliminated. Also, the assignment of different homework is more practical and feasible than the assignment of enrichment work, which requires teachers to prepare for enrichment activities (e.g., different learning activities or learning materials).

Korean elementary teachers showed higher trends in pull-out programs in which gifted students go to other classrooms for enrichment learning activities, even though such programs would be implemented during regular hours (Figure 4). The pull-out programs have not yet been actively implemented in Korean gifted education, but the new comprehensive plan (Korean Ministry of Education, 2013) intends to introduce them.

In the teachers' comments, quite a few teachers mentioned the difficulties in implementing gifted education in the regular classroom. For example, one teacher expressed a radical opinion, saying that, "Gifted education in the public school system is unrealistic" (case 234). Another teacher preferred non-regular school hour programs to programs in the regular classroom, suggesting that, "I do not agree with gifted education in the regular school curriculum, but I agree with specialized programs or after-school gifted programs" (case 254). Also, the third teacher mentioned the impossibility of implementing gifted programs in the regular classroom, saying that, "While gifted programs should remain this way, I think that incorporating gifted education into the regular curriculum is irrational" (case 277). Thus, Korean elementary teachers showed higher trends in the implementation of pull-out programs, in which gifted students are separated from other students and educated using practices to develop academic talents (Figure 4).

In particular, Korean elementary teachers showed relatively high trends in eliciting high-level thinking skills, although this option would be employed during school hours (Figure 4). This is a very appropriate perception, according to the literature. Davis and Rimm (2004) suggest that eliciting high-level thinking skills is one of the most important topics in educating gifted students. In relation to Bloom's taxonomy that shows the classification of levels of intellectual behavior important in learning (e.g., knowledge, comprehension, synthesis and evaluation), they recommended the following point for gifted students. With gifted students, more time should be invested in higher-level learning activities such as analysis, synthesis and evaluation.

Ninety-three percent of the Korean elementary teachers who responded to this study were in agreement with the necessity of eliciting high-level thinking skills. However, teachers commented that they did not know how to implement these types of practices. One teacher pointed out that, "Teachers should be given in-depth training (in order for content-related capacity to be increased, training should be linked to college institutions)" (case 226). Also, another teacher stressed the necessity of teacher training related to the improvement of teacher quality, suggesting that, "It would be good if there were more systematic programs for developing teachers professionally. There is a lack of teaching material to provide to the students" (case 292). Through these comments, teachers voiced their opinions on the difficulties of implementing teaching practices used in gifted education.

Choe and Park (2004) confirmed this gap between teachers' abilities and their practices. They investigated 174 elementary teachers' perceptions about how to teach gifted students. The teachers with experience in gifted programs (75.5%) responded that they would use the gifted programs in general classes or enrichment classes for gifted students. However, the participants in Choe and Park's study showed low comprehension of specific teaching strategies for gifted students, such as Creative Problem Solving (CPS), deductive and inductive thinking skills, and curriculum compacting. The new comprehensive plan for gifted education (Korean Ministry of Education, 2013) underscores the enhancement of professional quality of teachers. Thus, the government should provide teachers with knowledge and skills on how to employ these teaching strategies commonly used in gifted education through professional development.

In a second trend, Korean elementary teachers showed conflicting and ambivalent attitudes and perceptions toward creativity. In this study, some teachers mentioned the development of creativity as being an important factor in gifted education as well as being one of the goals of gifted education. For example, one teacher mentioned that, "there is a severe need for gifted education that emphasizes creativity and character building" (case 226). Also, another teacher agreed that, "Korean gifted education only emphasizes certain subjects, is obsessed with rankings, and stunts creativity" (case 71). In particular, when asked about the goal of gifted education in open-ended question 1, one teacher explicitly commented that, "The goal of gifted education is the nurturing of creative individuals and the expansion of diverse educational experiences" (case 56). Another teacher voiced that, "The goal of gifted education is …The exhibition of creativity, respecting diversity…" (case 453). In addition, many teachers (around 65.0%) agreed with the statement that creativity can be developed through training, related to the giftedness construct in the previous section (Figure 3). However, in practice, they showed ambivalent perceptions; although they showed higher trends for creativity training programs as a gifted service option, they consistently showed lower trends for creativity training within the regular curriculum as seen in Figure 4.

Consequently, Korean elementary teachers showed contradicting perceptions about creativity. Teachers demonstrated higher averages for the malleability of creativity and its training, but they showed relatively lower averages in practices related to creativity training programs during regular school hours. Regarding the reasons why they showed such perceptions, the following interpretation may be possible. Teachers might perceive that creativity training programs are beneficial and necessary for gifted students, but in practice, they may think that the implementation of the creativity training programs during school hours is difficult and impractical.

The disconnect between teacher beliefs and actual practices appears in the results of other studies (Haney & McArthur, 2002; Yang, Han, Chae, Oh, & Cho, 2005). As an example, in Noh, Kim, and Paik's (2008) study, there was a gap between gifted high school students' science teachers' beliefs about gifted education and their classroom practices. Although one of the three teachers in this study had student-centered beliefs, his class was composed of teacher-centered classroom practices. They maintain that although teachers perceived the necessity of such teaching practices for gifted students, in reality, their beliefs or perceptions related to accommodation were not necessarily implemented. This is due to the fact that the actual classroom environment or requirements for teachers did not allow much accommodation. Therefore, the results from studies cited in the previous section and from the findings of this study provide the following critical insight. It is necessary for the government to try to provide classroom environments in which the gap between teachers' perceptions and their practices can be reduced in order to implement gifted education successfully.

Talent development support in nonacademic domain. Korean elementary teachers in this study showed three common trends related to nonacademic talent development support (Figure 9-10). First, they showed higher trends in the implementation of out-of-school gifted programs (Figure 9). This first trend aligned with the results obtained in this study that provided information about teachers' perceptions related to nonacademic talent development. Participants responded to the following questions: (a) "Out-of-school gifted programs are superior to within-school gifted programs in developing gifted students' motivation in nonacademic domains" (P7_5) and (b) "School teachers have limited knowledge and skills in developing gifted students' talents to the highest level in nonacademic domains" (P7_6). Ninety percent of the participants in this study expressed varying amounts of agreement with the first statement (P7_5). Additionally, 91.5% of respondents also agreed to varying degrees with the second statement (P7_6). Thus, it is understandable that these teachers supported out-of-school gifted programs in nonacademic domains. The TDMM (2011) proactively recommends that out-of-school programs, such as sports clubs or talent search programs in the universities, should be employed for talent development.

In the second trend, Korean elementary teachers did not demonstrate high trends in the accommodation of nonacademic gifted programs during regular school hours, as indicated by Figure 9. This may reflect teachers' perceptions, mentioned in the previous section, that they have limited knowledge and skills, and that out-of-school programs are superior to in-school programs. One teacher similarly mentioned this point, suggesting that, "Instead of limiting the education of gifted children to schoolteachers, it would be favorable if an environment was created where experts from various domains could participate in teaching as well" (case 102). This result can also be connected with quite a few teachers' perceptions that gifted programs during regular school hours are difficult to implement. It can be speculated that many teachers, when considering actual practices in the school, did not support gifted programs for nonacademic domains as part of the regular curriculum.

In addition, Korean elementary teachers showed relatively low averages for the provision of free programs for all students in nonacademic talent development. Some teachers commented about providing students with opportunities to find their talents.

For example, one teacher commented that, "I think there should be more opportunities provided to gifted students in their selected field" (case 42). Also, another teacher suggested that, "There should be sufficient opportunities provided for gifted students (fees supported by the government)" (case 226). In addition, many talent development models, such as Tannenbaum's talent-development model (2003) or the DMGT by Gagné (2010), emphasize the role of opportunity or chance in finding and developing talents. Nonetheless, teachers did not support free programs for all students to develop nonacademic talents.

Some teachers commented on the difficulty in implementing gifted programs in the public schools. For example, one teacher mentioned that, "The public school system is trying too hard to accommodate all fields. The school has no room for talent development in diverse fields" (case 59). Also, another teacher indicated that, "it is very difficult for schools to implement programs for gifted students. The government should select gifted students and provide them with programs (it is necessary to have a system that does not exclude students from low SES families in this case)" (case 436). It is possible that practicality in implementing services for talent development affected teachers' views on the issue.

Gifted services to be provided. Korean elementary teachers indicated high averages for accommodations in most gifted services (e.g., mentorship, field trip and special schools for talent development) except grouping practices as seen in Figure 4. For example, they showed a relatively high mean score in the provision of after-school programs in more diverse domains as seen in Table 7. This result can be interpreted as follows. Because there is an imbalance between gifted programs in mathematics and science (83%) and those in other fields, such as music and athletics (17%), it is natural for teachers to support services in diverse domains (Korean

Ministry of Education, 2013). One teacher suggested that, "Because gifted education is not actively implemented yet in Korea, there are few gifted programs. It is necessary to implement gifted programs in more diverse domains" (case 11). Another teacher mentioned the problem of gifted programs in focused areas, stating, "It is also necessary to develop giftedness in non-academic areas, not just in math and science" (case 86).

Korean elementary teachers in this study showed considerably high trends in the gifted service option of special schools to develop gifted students' talents as seen Figure 4. Teachers' comments provided an explanation as to why it is not easy to implement gifted education in regular public school classrooms. They suggested that special facilities or learning materials are insufficient in public schools. For example, a teacher maintained that, "Realistically, gifted education in public schools is hard. There is no choice but to use government-run specialized facilities or private institutions" (case 317). Also, another teacher mentioned the problem of a lack of facilities in implementing gifted education, commenting that, "Giftedness can be identified but it is being buried because there is no facility responsible for students until the end" (case 361). Kim's study (2013) provides evidence for this suggestion. In this study, some teachers working at a gifted center for music talent development maintained that the government should make special schools to develop music talent systematically. Coleman (2005) contends that the most intensive education option for nurturing talent is selective institutions such as elite training centers, conservatories, or special schools. In alignment with this literature, Korean elementary teachers viewed special schools as a positive option for gifted students.

Grouping practices in the regular classroom showed relatively lower averages than did special schools (Figure 4). This trend reflects a long-established educational philosophy of equalization of education for all students in South Korea. Because this philosophy has become so ingrained in the Korean public schools, it is not easy to deviate from such a solid frame and belief system. For example, Korean public schools have basically provided elementary students with the same textbooks and teaching levels in the same classes, although there can be some exceptions depending on the context. Thus, although grouping practices are very useful for students' achievement or motivation (Tieso, 2002), stakeholders such as parents and community members may be particularly unwilling to accept grouping by ability. This may be associated with a belief that grouping by ability goes against the basic philosophy of equalization of education.

Differences in Perceptions among Demographic Groups Related to Talent Development Support

Korean elementary teachers shared similar general perceptions in survey items related to TDS regardless of demographic groups, but they showed differences in perception depending on their demographic groups. In particular, Korean elementary teachers showed different perceptions about supporting some practices and gifted services based on their teaching levels and years of teaching experience. However, these differences were not statistically significant.

In contrast, Korean elementary teachers showed statistically significant differences in their perceptions based on the variables of the participation in professional development and knowledge about the implementation of gifted programs in their schools. The following section will discuss these differences and their implications for Korean gifted education.

Participation in professional development. Korean elementary teachers showed statistically significant differences according to their participation in professional development. Teachers with professional development showed a higher rate of agreement for the accommodation of teaching practices for students' talent development (Appendix H). For example, in practices such as eliciting high-level thinking, pull-out programs, grouping by ability, and special schools for talent development, the group with professional development was more supportive of accommodating teaching practices while the group without professional development was less supportive of accommodation of these practices. Therefore, participation in professional development was associated with the differences in Korean elementary teachers' perceptions related to support for talent development.

However, differences in the participation in professional development did not appear to affect the common trend in individual survey items that Korean elementary teachers showed related to their accommodation of talent development. Both teachers with and without professional development supported implementing pull-out programs and eliciting high-level thinking. Also, these groups similarly showed a lower rate of agreement for the accommodation of practices such as creativity lessons within the regular curriculum and the elimination of curricular materials mastered by students during regular school hours. Although professional development in Korean gifted education was associated with enhanced understanding by teachers about specific practices or gifted services, it did not change the common patterns or trends that appeared across all demographic groups. Thus, for professional development to fulfill its role faithfully, it should serve to lead teachers to openly accept beneficial practices and break out of undesirable patterns for gifted students.

For example, the research conducted by Reis, Westberg, Kulikowich, and Purcell (1998) demonstrated that there were no differences in scores between gifted students receiving curriculum compacting and gifted students receiving regular instruction, which is described in more detail in Chapter 2. Although this research suggested that curriculum compacting does not have any detrimental effects on gifted students and provides them with time to participate in enrichment work, Korean elementary teachers' perceptions toward curriculum compacting were not supported. Although there can be diverse reasons for teachers not to be supportive of the curriculum compacting (i.e., the differences in educational philosophy), it is necessary for them to consider and implement the practice to develop gifted students' ability, despite some limitations. In the future, it is necessary for professional development to perform its role of changing such perceptions.

The presence of gifted programs in the school. Korean elementary teachers in this study had differences in their perceptions between the group with gifted programs in their schools and the group without knowledge of gifted programs in their schools. Teachers without knowledge related to the presence of gifted programs in the schools showed the lowest mean scores in TDS among the three groups. As the previous section explains, the fact that nearly one third of respondents did not know whether their schools implemented gifted programs may be a considerable concern. The results in this study showed that the group with gifted programs in their schools was more supportive in accommodating practices for talent development than the group without knowledge of the presence of gifted programs. However, there was no significant difference in mean scores between the group with gifted programs and the group without gifted programs. This implies the importance of communicating about gifted programs as well as implementing them. The indifference or ignorance of teachers about gifted programs in their schools was associated with less support for talent development.

As the major and minor themes of open-ended Question 2 showed (see Table 9), most Korean elementary teachers did not give Korean gifted education a highly favorable evaluation. Moreover, quite a few elementary teachers (32.7%) showed ignorance of the presence of gifted programs in their schools. Therefore, this study suggests that it is necessary for gifted education administrators to take measures to educate teachers about gifted programs and to improve their perceptions toward gifted education. Fullan (2001) suggests that merely having innovative ideas is not sufficient to lead change.

Implications and Recommendations

In this study, the efforts to investigate the perceptions of Korean elementary teachers about giftedness and support for gifted students' talent development were made based on two research questions. As a result, two constructs of TCGiftedness and TDS were created to obtain answers about these research questions. In TCGiftedness, the perceptions of a full sample leaned more toward the contemporary approach, but the degree of their orientation was not high. Also, the perception of a full sample in TDS supported the accommodation of teaching practices for gifted students' talent development, but again, the degree of support was not very high. Based on these overall results about a full sample's perceptions, the following implications and recommendations will be addressed for practices in Korean gifted education.

Implications and Recommendations Related to Giftedness

As the previous section discusses, the Korean government has made many efforts to encourage gifted education to take root in the Korean school system through laws, enforcement ordinances, and comprehensive plans. In particular, to improve teachers' perceptions toward gifted education and to enhance their professional quality, diverse measures have been taken. As a result, the Third Comprehensive Plan for Improvement of Gifted Education (Korean Ministry of Education, 2013) indicates that, the current Korean gifted education pursues enhancing overall quality in gifted education (i.e., evaluation the quality of gifted programs) beyond expanding the quantitative ground (i.e., the calculation of the number of schools where gifted programs are implemented).

However, as this study's results show, efforts to educate teachers, particularly general teachers, about gifted education are still insufficient. For example, as this study showed, in the capital city of South Korea, only 9.8% of teachers working in public schools have the opportunities to participate in a professional development introducing the concept of giftedness. In other training related to gifted education (e.g., gifted education workshops or educational degrees in gifted education), the rate of participation was even lower. It can be speculated that the rate of participation will be lower in other regions such as rural areas where SES is relatively low.

Although Korean elementary teachers in this study showed that their perception of TCGiftedness leaned more toward a contemporary perception, the degree of orientation was not high. To improve general teachers' perceptions related to giftedness, the government needs to educate teachers more proactively through diverse strategies such as professional development. In particular, this study's results convey very critical points. Although only one quarter of respondents participated in professional development, the group showed statistically significant differences in their perceptions related to TCGiftedness compared to the perceptions of the group without participating in professional development. Also, the differences in participants' perceptions regarding TCGiftedness between the group without knowledge about the existence of gifted programs in their schools and the group with knowledge about the existence of gifted programs (whether the program existed or not in their schools) showed small effect sizes but they were closer to 0.50 indicating medium effect size (ES=0.37, and ES=0.39 respectively). Thus, the government needs to seriously consider educating both general teachers and gifted teachers in diverse aspects such as giftedness, gifted programs and teaching strategies and skills related to gifted education. This becomes a more important issue in the current context where teachers' observation and recommendation are emphasized in identifying gifted students.

Implications and Recommendations Related to Talent Development Support

In relation to TDS, the full sample showed support for the accommodation of teaching practices for students' talent development, but the support was not drastically high. As the previous section explains, gifted education for elementary students is actually implemented in institutions outside of regular public schools. It is possible to speculate that the fact that a very small number of students are selected and educated contributes to such situation because it can be more economical if these institutions rather than the regular schools educate a few selected students. However, this situation may cause the concern that prevents more students from accessing to gifted programs to explore and develop their academic and nonacademic talents in their regular schools.

Moreover, two facts further aggravate such situations. First, because these institutions outside of regular public schools have taken on gifted students' talent development, it is possible that public schools have not made many efforts to establish their infrastructure related to gifted education. In addition, the fact that most gifted programs are focused on math and science means that the government supports and allocates its budget in these domains. Thus, although regular public schools want to support students' talent development in diverse domains such as music, art, and athletics, it is not easy to implement these programs in such domains due to a lack of funding. Consequently, this situation can cause the start of a vicious cycle. Because schools do not proactively implement gifted programs including gifted programs in nonacademic areas due to several reasons such as the lack of infrastructure or funding, teachers do not pay attention to them. Thus, they become indifferent to gifted programs and their support for talent development tends to decrease. This situation can be connected with the situation in which because teachers are indifferent to students' talent development and gifted education, other institutions have to take on the role of providing gifted education instead of regular schools.

To prevent this vicious cycle, it is necessary for the government to consider how to establish the infrastructure for gifted education so that more students with diverse talents can have opportunities to participate in gifted programs in public schools. When the government tries to establish appropriate infrastructure such as facilities, personnel and resources to implement gifted education, Korean elementary teachers' support for the accommodation of teaching practices for gifted students' talent development will increase.

Recommendations for Future Study

This study provides teachers, administrators or policy planners with an overall picture related to Korean elementary teachers' perceptions in terms of giftedness and support for talent development. Thus, in the future, it is necessary to conduct more detailed research about this topic. For example, this study presents results regarding whether diverse demographic groups formed based on four variables have different perceptions. However, it is necessary for future studies to further investigate why such demographic groups show differences in their perceptions related to giftedness and support for talent development. Also, this study showed that participants demonstrated common perceptions in individual items comprising TCGiftedness and TDS. However, future study needs to be conducted to investigate why they showed such common trends in these survey items. Finally, this is an exploratory research and there is little research related on this topic. Thus, future research comparing and contrasting the perceptions of teachers from western countries with those of teachers from oriental countries, or the perceptions of teachers across Asian countries would produce more meaningful results regarding teachers' perceptions about talent development.

Conclusion

This study originated from such concerns about Korean gifted education as low participation by few students in gifted programs and the narrowly focus of those programs on math and science. However, after the announcement of a new gifted education plan that emphasized the introduction of teachers' observations and recommendations as identification methods, a concern arose regarding the important influence of teachers' perceptions on the selection of gifted students. As a result, this research was conducted investigating Korean elementary teachers' perceptions about giftedness and support for talent development. This research obtained results regarding Korean elementary teachers' general perceptions in survey items related to the two constructs, as well as their different perceptions among demographic groups.

In relation to giftedness, although they leaned more toward the contemporary approach when asked about domain-specific giftedness and enjoyable involvement in finding talents, quite a few teachers still maintained traditional perceptions when asked about high IQ and fixed intelligence. Regarding support for talent development, they agreed with most practices and gifted service options for talent development. However, they were less supportive of practices during regular school hours (e.g., grouping practices and non-academic gifted programs during school hours). As a result, pull-out programs, out-of-school programs, and special schools for talent development were more supported than programs during school hours. In addition, the notable concerns included, but were not limited to, many negative evaluations of Korean gifted education and a lack of knowledge among Korean elementary teachers about gifted programs implemented in their schools.

Based on these findings, the following suggestions can be made. First, it is necessary for the government to consider how best to change teachers' incorrect perceptions or insufficient knowledge about gifted programs or gifted education. Second, based on teachers' corrected perceptions, it is critical for the government to encourage teachers to accommodate beneficial practices for students' talent development, providing teachers with these teaching strategies and skills commonly used in gifted education. Finally, it is time for the government to seriously consider establishing more special schools in more diverse domains, which can compensate for the limitations and difficulties in implementing gifted programs for talents development in regular public schools. This is because such schools with excellent professionals and curriculum can help provide gifted students showing diverse talents with more opportunities to be systematically identified and to develop their talents to the highest level.

APPENDIX A

RESEARCH PARTICIPATION CONSENT FORM

What we hope to learn from you and why it is important:

The title of this study is: "Korean Elementary Teachers' Perceptions about Giftedness and Teaching Gifted Students in Terms of Talent Development." In our research, we are trying to learn what perceptions Korean elementary teachers have regarding giftedness and teaching gifted students related to gifted students' talent development. Through this research, we hope to obtain a better understanding of this topic.

How you were selected:

All teachers are being asked to participate in this study as you are enrolled in the two elementary schools selected among schools that are included in each district office of education in Seoul.

How we will conduct the study, and what we will ask of you:

- You will participate in one survey research, approximately one hour in length, in July. The time and place of conducting the survey research will be determined according to your, your colleagues and your school schedule and availability.
- You will respond to a paper-and-pencil questionnaire.

Additional information:

- The primary researchers will be Young-Eun Son, a Ph.D. candidate in the William & Mary School of Education. This research is being conducted as part of a Dissertation course, under the tutelage of Dr. Tracy L. Cross.
- Confidentiality will be protected to the maximum extent. There will be nothing in any of these documents, any publications or presentations that would enable anyone to ascertain your identity. In particular, the supervisor will not see the individual results to help with anonymity and only collective responses will be noted.

- Your participation is completely voluntary, and you may decline to participate or you may withdraw at any time or refuse to answer any question on the survey. None of these will incur a penalty of any sort, and will not jeopardize your relationship with your school or district offices of education in Seoul.
- If you have any questions or concerns before, during, or after this study, please contact Young-Eun Son (yson@email.wm.edu, . You may also contact the supervising professor, Dr. Cross (tlcross@wm.edu). If you have additional questions or concerns about your rights as a participant, or are dissatisfied at any time with any aspect of this study, you may contact, anonymously if you wish, the two chairpersons of the W&M committees which supervise the treatment of study participants: Dr. Tom Ward (tjward@wm.edu) and/or Dr. Ray McCoy (rwmcco@wm.edu).

By checking the "I agree to participate" response below, then signing and dating this consent form, you will indicate your voluntary agreement to participate and confirm that you are at least 18 years of age.

__ I agree to participate.

__ I do not agree to participate.

You will be given a copy of this consent form to keep.

Signatures:

Participant: ____

Date: ________________

APPENDIX B

INSTRUCTION FOR ADMINISTRATION OF THE SURVEY

- Please, allow **appropriate time and place** for teachers to fill out this survey all together.
- In order to achieve the most valid results, teachers must **feel free to express their opinions** about survey questions. Once the administrator reads the following instruction to the teachers, she or he should **leave** the room. Also, teachers must be confident that completed surveys will not be viewed by their supervisor.
- Please, **distribute** both Informed Consent Form and survey **together**, but **collect** them **separately**.
- Please **read this** to the teachers before they begin:

"This is a study investigating Korean elementary teachers' perceptions about giftedness and teaching gifted students related to gifted students' talent development. Please **sign the Informed Consent Form** if you agree with the statements, before filling out the survey. Please **do not write your name** on the survey, as all information will be anonymous and cannot be connected to you. There are many questions on the survey and we value your opinion on each one. There are **no wrong or right answers**. If you have questions about survey items, please answer what you believe the question is asking. Please answer each question honestly. The results will not be opened to the supervisor."

- Please **ensure the confidentiality** of the surveys. As surveys are collected, please do not allow them to be viewed by administrators or students. Teachers should not see one another's survey.
- **Do not interpret questions** for teachers.
- After teachers complete survey, a participating teacher should collect the completed surveys, placed them in the provided envelope and seal it. Signed consent forms should be placed in the second provided envelope and sealed before delivering them to the administrator.

THANK YOU!

APPENDIX C

SURVEY QUESTIONS

Directions: Please complete the survey reflecting on your perceptions related to giftedness and teaching gifted students.

Informed Consent: By filling out this survey, I agree that I have been informed of its purpose and of my rights as a research subject. My anonymous responses may be used for research.

*If there is no agreement, we cannot use information of survey.

Please circle one: I agree I do not agree

Part 1: ***Respondent Demographics***

Please circle the answer that is most appropriate to you.

1. **Gender.**

   (1) Male
   (2) Female

2. **Your age range.**

   (1)20-30
   (2) 31-40
   (3) 41-50
   (4) 51-60
   (5) 61 and more

3. **Grade level now teaching.**

   (1)First(2) Second (3) Third (4) Fourth (5) Fifth (6) Sixth

4. **Years of teaching experiences:**

   (1) 1-3(2) 4-8 (3) 9-12(4) 13 or more

5. **Highest Degree Earned:**

   (1) Bachelor's (2) Master's (3) Doctorate (4) Other:

6. **Have you participated in professional development for teachers related to gifted education?**

(1) Yes (2) No

If yes, what kind of professional development have you attended related to gifted education? Circle all that apply.

(1) Programs introducing the gifted

(2) Workshops for teachers

(3) Non-degree courses at college/university (i.e., the certificate related to gifted education)

(4) Educational degree in gifted education

(5) Other ( )

Part 2: ***School Informati***on

7. **Does your school use any system to identify gifted students?**

(1) Yes (2) No (3) I do not know

8. **If yes, which of the following methods does your school use to identify gifted students? (Select all that apply)**

(1)IQ Tests (group or individual)

(2) Creativity Tests

(3) Grades

(4) Teacher Observation

(5) Teacher Recommendation

(6) Other: ________________

(7) I do not know

9. **Does your school implement any programs for gifted students?**

(1) Yes (2) No (3) I do not know

Part 3: *The following statements are about the characteristics of gifted students. Please circle the number indicating how much you agree or disagree.*

		Strongly Disagree	Disagree	Some-what Agree	Agree	Strongly Agree
1	*Students who have standardized test scores at the 98th percentile or above in all subjects are gifted.	1	2	3	4	5
2	*Students who have high IQ (at least IQ 130) are gifted.	1	2	3	4	5
3	*Students who show excellent performance only in one domain are gifted.	1	2	3	4	5
4	*Students who show high capabilities in verbal/linguistic intelligence are gifted.	1	2	3	4	5
5	*Students who show high capabilities in logical/mathematic intelligence are gifted.	1	2	3	4	5
6	*Students who show high capabilities in spatial intelligence (e.g., manipulating three-dimensional configurations) are gifted.	1	2	3	4	5
7	*Students who show leadership ability or potential are gifted.	1	2	3	4	5
8	*Students who show ability or potential in theatre/drama are gifted.	1	2	3	4	5

Note: Same asterisk (*) indicate that those items were modified from Schroth and Helfer's (2009) survey with permission from the authors.

Part 4: *The following statements are about giftedness and intelligence. Please circle the number indicating how much you agree or disagree with the following statements.*

		Strongly Disagree	Disagree	Some-what Agree	Agree	Strongly Agree
1	You have a certain amount of intelligence, and you really *can't* do much to change it. (Dweck, 2008)	1	2	3	4	5

2	Your intelligence is something about you that you *can't* change very much. (Dweck, 2008)	1	2	3	4	5
3	You can learn new things, but you *can*not really change your basic intelligence. (Dweck, 2008)	1	2	3	4	5
4	Creativity can be developed through training.	1	2	3	4	5
5	Gifted persons are a valuable resource for our society.	1	2	3	4	5
6	Gifted students show high achievement due more to high motivation than high IQ.	1	2	3	4	5
7	Gifted students show high task commitment due more to enjoyment of learning than due to teachers' praise or rewards.	1	2	3	4	5
8	Success in a professional field is due more to psychosocial factors (i.e., perseverance) than innate abilities.	1	2	3	4	5

Part 5: ***The following statements are about the development of giftedness in talent domains. Please circle the number indicating how much you agree or disagree.***

		Strongly Disagree	Disagree	Some-what Agree	Agree	Strongly Agree
1	Schools should start the formal identification process to identify gifted students' talents as early as possible.	1	2	3	4	5
2	It is better for gifted students to specialize in one domain as early as possible (i.e., kindergarten) and focus their learning and practices on the specialized domain.	1	2	3	4	5
3	*Giftedness in ***academic domains*** during childhood leads to success as professionals in the same domains during adulthood.	1	2	3	4	5
4	*Giftedness in ***nonacademic domains*** (e.g., leadership, music or sports) during childhood leads to success professionals in the same domains during adulthood.	1	2	3	4	5

Note: Same asterisk (*) indicate that it was decided to eliminate two items in analysis and interpretation, because of a little concern in interpretation and the issue of reliability.

Part 6: ***The following statements are about teaching gifted students in academic domains. Please circle the number indicating how much you agree or disagree with the following statements.***

		Strongly Disagree	Disagree	Some-what Agree	Agree	Strongly Agree
1	Teachers should eliminate curricular material that students have already mastered.	1	2	3	4	5
2	Teachers should assign gifted students enrichment work (i.e., projects in interest areas) during class.	1	2	3	4	5
3	Teachers should use teaching strategies to elicit gifted students' high-level thinking.	1	2	3	4	5
4	Teachers should assign homework differently based on each student's ability.	1	2	3	4	5
5	Teachers should include lessons to develop gifted students' creativity within the regular curriculum.	1	2	3	4	5
6	Because it is difficult to teach gifted students appropriately in the regular classroom, schools should implement pull-out programs. * Pull-out programs (gifted students go to a different classroom prepared to have enrichment activities for 2-3 hours once or twice per week).	1	2	3	4	5

Part 7: ***The following statements are about developing talent in <u>non</u>academic domains (e.g., leadership, music, or the performing arts). Please circle the number indicating how much you agree or disagree.***

		Strongly Disagree	Disagree	Some-what Agree	Agree	Strongly Agree

1	Systematic programs for gifted students' talent development in nonacademic domains should be implemented during regular school hours.	1	2	3	4	5
2	Schools should increase the frequency of participation in after-school programs to provide gifted students with daily challenge in their nonacademic talent areas.	1	2	3	4	5
3	Schools should provide free programs for all students to offer opportunities to develop gifted students' talent development in nonacademic domains	1	2	3	4	5
4	Out-of-school gifted programs (e.g., music gifted centers funded by government) should be employed to nurture gifted students' nonacademic talents	1	2	3	4	5
5	Out-of-school gifted programs are superior to within-school gifted programs in developing gifted students' motivation in nonacademic domains.	1	2	3	4	5
6	School teachers have limited knowledge and skills in developing gifted students' talents to the highest level in nonacademic domains.	1	2	3	4	5
7	When teachers first find gifted students' talents in nonacademic domains, it is more important for them to help students become enjoyably involved in activities of each domain than to focus on developing their skills in those domains.	1	2	3	4	5

Part 8: ***Please circle the number indicating how much you agree or disagree that the following gifted services should be provided.***

		Strongly Disagree	Disagree	Some-what Agree	Agree	Strongly Agree

1	**Grouping** of students by ability level in the class	1	2	3	4	5
2	**Grouping** of students by interest with an expert or an expert teacher in the area in the regular class.	1	2	3	4	5
3	Pull-out programs (e.g., The use of more diverse teaching methods and learning materials for gifted students)	1	2	3	4	5
4	After-school programs to nurture talent in more diverse domains (e.g., leadership/language/ dance)	1	2	3	4	5
5	The implementation of after-school programs by out-of-school professionals (e.g., music instructor or tennis coach) to develop talents in nonacademic domains systematically	1	2	3	4	5
6	Mentorship with professionals in academic/nonacademic domains	1	2	3	4	5
7	Field trips for exposure to professionals in academic/nonacademic domains (e.g., scientist or ballet choreographer)	1	2	3	4	5
8	Special schools for talent development of each academic/nonacademic domain (i.e., science magnet school/Art school)	1	2	3	4	5
9	**Online learning** (i.e., taking gifted courses provided in foreign universities)	1	2	3	4	5
10	**Creativity training programs** (i.e., experiencing programs to develop creativity)	1	2	3	4	5
11	Training programs for the development of psychosocial skills (i.e., motivation)	1	2	3	4	5
12	The presentation of talents through performance and products before an outside-of-school audience (e.g., community members, parents)	1	2	3	4	5
13	**Participation in competition** in talent domains (e.g., science/ music)	1	2	3	4	5

- ***Thank you so much for participating in this study***

- ***What do you think is the goal of gifted education?***

- ***Please share any comments you may have about gifted education in Korea.***

APPENDIX D

설문지

<u>지시 사항</u>:영재성과 영재 학생들을 가르치는 것과 관련하여 응답자들의 인식을 반영하는 설문지를 완성해 주십시요.

<u>연구 참가 동의</u>: 이 설문지를 완성함으로써, 나는 연구 참가자로써 그 연구의 목적과 나의 권리에 대해 설명을 들었음을 동의합니다. 나의 익명의 답변들이 연구에 사용되어도 좋습니다.

동그라미 표시해 주십시요: 나는 동의한다   나는 동의하지 않는다

파트 1: 응답자들의 정보

본인과 관련하여 가장 적절한 대답에 동그라미 표시를 해주세요.

3. 성별

(1)남성   (2)여성

4. 연령대

(1)20-30 대 (2)30-40 대 (3)40-50 대 (4)50-60 대

(5)60 대이상

3. 지금 가르치고 있는 학년

(1)1학년 (2) 2학년 (3) 3학년 (4)4학년 (5)5학년 (6)6학년

4. 교직에 종사하신 햇수

(1) 1-3 년 (2)4-8 년 (3)9-12 년 (4)13 년 이상

5. 최고 학력

(1) 학사 (2) 석사 (3) 박사 (4) 기타 ( )

6. 영재교육과 관련하여 선생님들을 위한 연수 교육에 참여한 적이 있습니까?

(1) 예 (2) 아니오

만약 "예" 라고 대답했다면 영재교육과 관련하여 어떤 종류의 선생님 연수 교육에 참여하신 적이 있습니까? 해당되는 모든 곳에 표시를 해 주세요.

(1)영재 학생들에 대해 소개하는 프로그램들
(2) 선생님들을 위한 워크샵
(3)대학 졸업자들을 대상으로 하는 비학위 코스들 (예: 영재교육에 관련된 수료증)
(4) 영재교육 전공의 교육학 학위
(5) 기타 ( )

파트 2: 학교 정보

7. 당신의 학교는 영재 학생들을 선발하기 위한 어떤 시스템을 사용하고 있나요?

(1)예 (2)아니오 (3)모르겠습니다

8. 만약 "예" 라고 대답했다면, 당신의 학교는 영재 학생들을 선발하기 위해 어떤 방법을 사용하고 있나요? (해당하는 모든 것을 선택해 주세요.)

(1) IQ 시험 (그룹 혹은 개인) (2) 창의력 검사 (3) 성적
(4) 선생님 관찰 (5) 선생님 추천 (6) 기타 ( )

(7) 모르겠습니다.

10. 당신의 학교는 영재 학생들을 위해 어떤 프로그램을 시행하고 있습니까?

(1) 예 (2) 아니오 (3) 모르겠습니다

파트 3: 다음은 영재 학생들의 특징에 대해 설명하는 문장입니다. 자신이 아래의 설명에 얼마나 동의하는지를 표시해 주십시요.

		강하게 동의하지 않는다	동의하지 않는다	다소 동의 한다	동의 한다	강하게 동의한 다
1	영재 학생들은 모든 과목의 시험에서 98 퍼센트 이상의 점수를 맞는다.	1	2	3	4	5
2	영재 학생들은 높은 IQ를 보인다(적어도 IQ 130).	1	2	3	4	5
3	단지 한 분야에서 뛰어난 성취를 보여주어도 영재이다.	1	2	3	4	5
4	말/언어 지능에서 높은 능력을 보여주는 학생들은 영재이다.	1	2	3	4	5
5	논리적인/수학적인 지능에서 높은 능력을 보여주는 학생들은 영재이다.	1	2	3	4	5
6	공간 지능에서 높은 능력(예:삼차원적인 배치를 조작하기)을 보여주는 학생들은 영재이다.	1	2	3	4	5

7	리더십 능력 혹은 잠재력을 보여주는 학생들은 영재이다.	1	2	3	4	5
8	연극/드라마에서 능력 혹은 잠재력을 보여주는 학생들은 영재이다.	1	2	3	4	5

파트 4: 다음은 영재성과 지능에 대해 설명하는 문장입니다. 자신이 아래의 설명에 얼마나 동의하는지를 표시해 주십시요.

		강하게 동의하지 않는다	동의하지 않는다	다소 동의 한다	동의 한다	강하게 동의 한다
1	각자 어느 정도의 지능이 있을지라도 지능을 변화시키기 위해 할 수 있는 일은 많지 않다.	1	2	3	4	5
2	지능이라는 것은 매우 많이 변화시킬 수는 없는 것이다.	1	2	3	4	5
3	새로운 것을 변화시킬 수는 있지만, 자기의 기본적인 재능은 변화시킬 수 없다.	1	2	3	4	5
4	창의성은 훈련을 통해 개발될 수 있다.	1	2	3	4	5
5	영재들은 우리 사회를 위한 귀중한 자원이다.	1	2	3	4	5
6	영재 학생들은 높은 IQ 보다는 하고자 하는 높은 동기에 의해 뛰어난 성취를 보여준다.	1	2	3	4	5

7	영재 학생들은 선생님의 칭찬과 보상 보다는 학습의 즐거움 때문에 높은 과제 집착력을 보인다.	1	2	3	4	5
8	영재 학생들의 전문 분야에서의 성공은 타고난 능력보다 심리사회적인 요인들에(예: 인내심) 더 많이 기인한다.	1	2	3	4	5

파트 5: 다음의 문장은 재능 영역에서 영재성의 발달에 대한 것입니다. 자신이 아래의 설명에 얼마나 동의하는지를 표시해 주십시요.

		강하게 동의한다	동의하지 않는다	다소 동의한다	동의 한다	강하게 동의한 다
1	영재들의 재능을 조기에 발굴하기 위해 학교는 가능한 일찍 공식적인 선발을 시작해야 한다.	1	2	3	4	5
2	영재 학생들은 가능한 한 빠른 시기에 (예: 유치원) 재능을 보이는 한 영역에 특화해서 집중적으로 학습과 연습을 하는 것이 낫다.	1	2	3	4	5
3	학문 영역에서 어린 시절에 영재성을 나타낸 학생들은 성인이 된 후에도 같은 영역에서 전문가로서의 성공으로 이어진다.	1	2	3	4	5

4	비학문 영역 (예: 리더쉽 혹은 예체능)에서 어린 시절에 영재성을 나타낸 학생들은 성인이 된 후에도 같은 영역에서 전문가로서의 성공으로 이어진다.	1	2	3	4	5

파트 6: 다음의 문장은 *<u>학문 영역</u>*에서 영재 학생들을 가르치는 것에 대한 설명입니다. 자신이 얼마나 동의하는지를 표시해 주십시요.

		강하게 동의한다	동의하지 않는다	다소 동의한다	동의한다	강하게 동의한다
1	지금 가르치는 일반 교과 과정의 내용 중 영재 학생들이 이미 완전히 아는 부분은 생략해야 한다.	1	2	3	4	5
2	선생님들은 정규 수업 시간에 영재 학생들에게 심화 학습을 배정해야 한다. (예: 관심 분야의 프로젝트)	1	2	3	4	5
3	선생님들은 영재 학생들의 높은 수준의 사고력을 이끌어 내기 위한 적절한 교수 방법을 사용해야 한다.	1	2	3	4	5
4	선생님들은 각 학생의 능력 수준별로 다르게 숙제를 제시해야 한다.	1	2	3	4	5
5	영재 학생들의 창의성을 개발하기 위한 수업은 정규 교육 과정 안에 포함시키는 것이 더 낫다.	1	2	3	4	5

6	일반 교실에서 영재 학생을 적절하게 가르치는 것은 어렵기 때문에 학교는 풀 아웃 프로그램을 시행해야 한다. *<u>풀 아웃 프로그램</u>: 영재 학생들이 일주일에 한 두번 2-3시간 동안 심화 학습을 위해 준비된 다른 교실로 가는 것	1	2	3	4	5

파트 7: 다음의 문장은 *<u>비학문적인 영역</u>* (예: 리더쉽, 음악, 혹은 공연 예술)에서 재능을 발전시키는 것에 대한 질문들 입니다. 자신이 얼마나 동의하는지를 표시해 주십시요.

		강하게 동의하지 않는다	동의하지 않는다	다소 동의한다	동의한다	강하게 동의한다
1	비학문적인 영역에서의 재능을 나타내는 영재 학생들을 교육하기 위해 체계적인 프로그램들이 정규 수업시간 동안 시행되어야 한다.	1	2	3	4	5
2	학교는 비학문적 영재들에게 매일의 도전을 제공하기 위해 방과 후 프로그램들에 참가하는 횟수를 늘려야 한다.	1	2	3	4	5
3	비학문적인 영역에서의 재능을 발전시킬 기회를 제공하기 위해서는 학교가 모든 학생들을 위한 무상 프로그램들을 제공해야 한다.	1	2	3	4	5

4	비학문적인 재능들을 키우기 위해서는 학교 밖에서 시행되는 영재 프로그램들 (예: 정부가 운영하는 음악 영재원)이 활용되어야 한다.	1	2	3	4	5
5	학교 안보다 학교 밖의 비학문적 재능을 위한 영재 프로그램들이 영재 들의 하고자 하는 동기를 발전시키는데 있어서 더 우수하다.	1	2	3	4	5
6	비학문적 재능을 가장 높은 수준으로 발달 시키기에는 학교 선생님들의 지식과 기술은 제한적이다.	1	2	3	4	5
7	학교 선생님들이 영재 학생들의 재능을 처음 발견할때는 그들의 기술 발전보다는 즐겁게 접해보도록 도와주는 것이 좀더 중요하다.	1	2	3	4	5

파트 8: 다음의 영재교육 서비스들이 제공되어야 한다는 것에 자신이 얼마나 동의하는지를 표시해 주십시요.

		강하게 동의하지 않는다	동의하지 않는다	다소 동의한다	동의한다	강하게 동의한다
1	수업에서 능력별로 학생을 그룹화하여 가르치기	1	2	3	4	5
2	정규 수업에서 관심 분야에 따라 학생들을 그룹화하여 전문가 혹은 전문성을 가진 선생님과 함께 수업함	1	2	3	4	5

3	풀 아웃 프로그램(교실) 실시 (예: 영재들을 위해 일반 교실보다 좀 더 다양한 교수법과 학습 교재 사용)	1	2	3	4	5
4	좀 더 다양한 재능 영역들에서의 방과 후 프로그램 실시 (예: 리더쉽/언어/댄스)	1	2	3	4	5
5	체계적 재능 발달을 위해 외부 전문가들 (예:음악 강사 혹은 체육 코치)에 의한 비학문적 영역 에서의 방과 후 프로그램 실시	1	2	3	4	5
6	학문/비학문 분야에서의 전문가들과의 멘토쉽	1	2	3	4	5
7	학문적/비학문적 영역들에서 전문가들을 만나기 위한 현장 체험 학습 (예: 수학자/발레 안무가)	1	2	3	4	5
8	각 학문/비학문 분야에서의 재능 발달을 위한 그 분야에 특화된 학교 설립 (예: 과학 영재 학교/ 특화된 음악학교)	1	2	3	4	5
9	온라인 학습 시행 (예: 외국 대학의 영재 프로그램 수강)	1	2	3	4	5
10	창의력 훈련 프로그램 시행 (예: 영재 창의성 개발 프로그램 체험)	1	2	3	4	5

11	심리사회적인 능력 (예: 성취 동기) 들을 발달 시키기 위한 훈련 프로그램	1	2	3	4	5
12	학교 밖의 외부 관객(예: 지역 주민, 학부모 등) 앞에서 공연이나 결과물 통해 재능 발표하기	1	2	3	4	5
13	재능 영역들에서 경시/경연 대회에 참가 (예:과학/음악)	1	2	3	4	5

➢ **이 연구에 참가해 주셔서 감사합니다.**

➢ **영재 교육의 목표는 무엇이라고 생각하십니까?**

➢ **한국의 영재 교육에 대해 당신이 가지는 의견이 있다면 적어 주세요.**

APPENDIX E

SURVEY QUESTIONS CROSSWALK

This table shows how each item in the questionnaire responds to each research question and on what literature the item is based.

Item Number	Research Question1	Research Question 2	Literature
Part 3			
1	X		Schroth (2007); Winner (1996)
2	X		Borland, (2003); Sternberg (1999); Winner (1996)
3	X		Subotnik, Olszewski-Kubilius & Worrell (2011);
4	X		Gardner (1983,1993;1999); Lazear (1991); NAGC (2008); Schroth (2007)
5	X		Gardner (1983,1993;1999); Lazear (1991); NAGC (2008); Schroth (2007)
6	X		Liben (2009)
7	X		Dai & Chen (2013); Schroth (2007); Subotnik, Olszewski-Kubilius & Worrell (2011)
8	X		Schroth (2007); Subotnik, Olszewski-Kubilius & Worrell (2011)
Part 4			
1	X		Dweck (2008)
2	X		Dweck (2008)
3	X		Dweck (2008)
4	X		Simonton (2000); Subotnik & Jarvin (2005); Subotnik, Olszewski-Kubilius & Worrell (2011)
5	X		Gagné & Nadeau (1991)

6	X		Gottfried & Gottfried (2004); Subotnik, Olszewski-Kubilius & Worrell (2011)
7	X		Covington & Dray (2002); Subotnik, Olszewski-Kubilius & Worrell (2011)
Item Number	Research Question1	Research Question 2	Literature
8	X		Simonton (2000); Subotnik & Jarvin (2005); Subotnik, Olszewski-Kubilius & Worrell (2011)
Part 5			
1		X	Choe & Park (2004); Subotnik, Olszewski-Kubilius & Worrell (2011)
2	X		Kim (2013); Subotnik, Olszewski-Kubilius & Worrell (2011)
3	X		Subotnik (2009); Subotnik, Kassan, Summers, & Wasser (1993); Subtnik, Olszewski-Kubilius & Worrell (2011); VanTassel-Baska (1989)
4	X		Subotnik (2009); Subotnik, Olszewski-Kubilius & Worrell (2011); VanTassel-Baska (1989)
Part 6			
1		X	Renzulli (1994); Renzulli & Reis (1997); Reis, Westberg, Kulikowich, & Purcell (1998)
2		X	Davis & Rimm (2004); Renzulli & Reis (1997); Rogers (2007); Subotnik, Olszewski-Kubilius & Worrell (2011)
3		X	Davis & Rimm (2004); Reis

			(1990)
4		X	Kulik (1992); Reis & Renzulli (2010); Rogers (2007)
5		X	Cramond & Kim (2008)
6		X	Vaughn, Feldhusen, & Asher (1991)
Part 7			
1		X	Kim (2013); Renzulli (1977); Reis & Burns (1987)
2		X	Rogers (2007); Subotnik, Olszewski-Kubilius & Worrell (2011)
3		X	Reis & Renzulli (2010); Subotnik, Olszewski-Kubilius & Worrell (2011)
Item Number	Research Question1	Research Question 2	Literature
4		X	Bloom (1985); Subotnik, Olszewski-Kubilius & Worrell (2011)
5		X	Richards (1991)
6		X	Choe & Park (2004); Kim (2013)
7	X		Kim (2013); Subotnik, Olszewski-Kubilius & Worrell (2011)
Part 8			
1		X	Kulik (1992); Rogers (2007)
2		X	Davis & Rimm (2004); Reis & Renzulli (1997)
3		X	Gallagher (2000); Kulik (1992); Rogers (1991)
4		X	Subotnik, Olszewski-Kubilius & Worrell (2011)
5		X	Kim (2013)
6		X	Dai & Chen (2013); Feng (2007); Subotnik, Olszewski-Kubilius & Worrell (2011)

7		X	Reis & Renzulli (1997)
8		X	Hwang & Kim (2009); Subotnik, Olszewski-Kubilius & Worrell (2011)
9		X	Adams & Cross (2000); Wallacem (2009)
10		X	Subotnik, Olszewski-Kubilius & Worrell (2011); Torrance (1972)
11		X	Jarvin & Subotnik (2010); Subotnik, Olszewski-Kubilius & Worrell (2011)
12		X	Kettle, Renzulli, & Rizza (1997); Reis & Renzulli (1997); Renzulli & Reis (1985); Subotnik (2004); Subotnik, Olszewski-Kubilius & Worrell (2011)
13		X	Subotnik, Olszewski-Kubilius & Worrell (2011)

APPENDIX F

INFORMATION ABOUT THE SCHOOLS PARTICIPATING IN THE STUDY

This table shows the number of teachers and students at schools participating in this study, and the number of teachers participating in this study.

The Name of District Office of Education	The Number of Teachers in the Schools that Participated in This Study	The Number of Student in the Schools that Participated in This Study	The Number of Teachers who Participated in This Study in the District
A. East	99	1552	69
B. West	50	469	35
C. South	206	3,515	98
D. North	118	2,051	72
E. Middle	127	1,687	53
F. GangDong	174	2,884	112
G. GangSeo	127	2,087	85
H. GangNam	165	2,314	87
I. DongJak	181	2,855	117
J. SungDong	167	2,395	112
K. SungBook	66	1,334	39
Total			
11	1,480	23,143	879 (Response rate:

			59.4%)

APPENDIX G

THE FREQUENCY AND PERCENTAGE OF RESPONSES IN DIVERSE DEMOGRAPHICS IN THE SURVEY ITEMS RELATED TO TCGIFTEDNESS

This table shows number and percentage of teachers agreeing with each item of the survey related to Traditional or Contemporary Giftedness (TCGiftedness).

Table G1

The Perceptions of Korean Elementary Teachers from Lower Grades (n = 352) about TCGiftedness

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
*98th percentile in all subjects	58 (16.5)	159 (45.2)	92 (26.1)	35 (9.9)	8 (2.3)
*High IQ over 130	5 (1.4)	58 (16.5)	116 (33.0)	146 (41.5)	27 (7.7)
Excellent Performance only in one domain	7 (2.0)	16 (4.5)	51 (14.5)	188 (53.4)	90 (25.6)
High capabilities in linguistic intelligence	7 (2.0)	73 (20.7)	101 (28.7)	131 (37.2)	40 (11.4)
High capabilities in mathematic intelligence	2 (0.6)	21 (6.0)	78 (22.2)	172 (48.9)	79 (22.4)
High capabilities in spatial intelligence	1 (0.3)	17 (4.8)	75 (21.3)	189 (53.7)	70 (19.9)
Leadership ability or potential	4 (1.1)	54 (15.3)	116 (33.0)	137 (38.9)	41 (11.6)
Drama ability or potential	9 (2.6)	58 (16.5)	109 (31.0)	132 (37.5)	44 (12.5)
*No much change in the amount of	18 (5.1)	176 (50.0)	100 (28.4)	56 (15.9)	2 (0.6)

intelligence					
*Intelligence as something without much change	17 (4.8)	114 (32.4)	139 (39.5)	72 (20.5)	10 (2.8)
*No much change in basic intelligence	15 (4.3)	145 (41.2)	131 (37.2)	54 (15.3)	7 (2.0)
The development of creativity through training	1 (0.3)	28 (8.0)	87 (24.7)	205 (58.2)	31 (8.8)
High achievement due to high motivation than high IQ	0 (0.0)	20 (5.7)	76 (21.6)	178 (50.6)	78 (22.2)
Success due to psychosocial factors than innate abilities	2 (0.6)	70 (19.9)	146 (41.5)	109 (31.0)	25 (7.1)
*Focus learning and practices on the specialized domain as soon as possible	21 (6.0)	154 (43.8)	89 (25.3)	68 (19.3)	20 (5.7)
The enjoyable involvement than developing skills	2 (0.6)	5 (1.4)	66 (18.8)	195 (55.4)	84 (23.9)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

Table G2

The Perceptions of Korean Elementary Teachers from Upper Grades (n = 420) about TCGiftedness

The Survey Items	**Strongly Disagree**	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
*98th percentile in all subjects	62 (14.8)	224 (53.3)	88 (21.0)	39 (9.3)	7 (1.7)
*High IQ over 130	19 (4.5)	71 (16.9)	158 (37.6)	139 (33.1)	33 (7.9)
Excellent Performance only in one domain	2 (0.5)	22 (5.2)	59 (14.0)	177 (42.1)	160 (38.1)
High capabilities in linguistic intelligence	6 (1.4)	57 (13.6)	113 (26.9)	162 (38.5)	82 (19.5)
High capabilities in mathematic intelligence	3 (0.7)	19 (4.5)	84 (20.0)	197 (46.9)	117 (27.9)
High capabiliti es in spatial intelligence	2 (0.5)	25 (6.0)	83 (19.8)	210 (50.0)	100 (23.8)
Leadership ability or potential	5 (1.2)	67 (16.0)	126 (30.0)	167 (39.8)	55 (13.1)
Drama ability or potential	8 (1.9)	48 (11.4)	137 (32.6)	162 (38.6)	65 (15.5)
*No much change in the amount of intelligence	28 (6.7)	207 (49.3)	112 (26.7)	68 (16.2)	5 (1.2)

*Intelligence as something without much change	29 (6.9)	142 (33.8)	149 (35.5)	88 (21.0)	12 (2.9)
*No much change in basic intelligence	20 (4.8)	177 (42.1)	132 (31.4)	78 (18.8)	12 (2.9)
The development of creativity through training	6 (1.4)	27 (6.4)	121 (28.8)	224 (53.3)	42 (10.0)
High achievement due to high motivation than high IQ	1 (0.2)	22 (5.2)	88 (21.0)	179 (42.6)	130 (31.0)
Success due to psychosocial factors than innate abilities	9 (2.1)	78 (18.6)	152 (36.2)	139 (33.1)	42 (10.0)
*Focus learning and practices on the specialized domain as soon as possible	53 (12.6)	213 (50.7)	77 (18.3)	56 (13.3)	21 (5.0)
The enjoyable involvement than developing skills	4 (1.0)	9 (2.1)	82 (19.5)	208 (49.5)	117 (27.9)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

Table G3

The Perceptions of Korean Elementary Teachers with Teaching Experience of 1-3 Years (n = 101) about TCGiftedness

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
*98th percentile in all subjects	15 (14.9)	63 (62.4)	17 (16.8)	3 (3.0)	3 (3.0)
*High IQ over 130	4 (4.0)	15 (14.9)	42 (41.6)	35 (34.7)	5 (5.0)
Excellent Performance only in one domain	0 (0.0)	3 (3.0)	10 (9.9)	49 (48.5)	39 (38.6)
High capabilities in linguistic intelligence	2 (2.0)	9 (8.9)	32 (31.7)	45 (44.6)	13 (12.9)
High capabilities in mathematic intelligence	0 (0.0)	5 (5.0)	15 (14.9)	57 (56.4)	24 (23.8)
High capabilit ies in spatial intelligence	0 (0.0)	5 (5.0)	18 (17.8)	54 (53.5)	24 (23.8)
Leadership ability or potential	2 (2.0)	9 (8.9)	30 (29.7)	47 (46.5)	13 (12.9)
Drama ability or potential	1 (1.0)	13 (12.9)	30 (29.7)	43 (42.6)	14 (13.9)
*No much change in the amount of intelligence	9 (8.9)	56 (55.4)	24 (23.8)	10 (9.9)	2 (2.0)
*Intelligence	9	39	32	18	3

as something without much change	(8.9)	(38.6)	(31.7)	(17.8)	(3.0)
*No much change in basic intelligence	5 (5.0)	43 (42.6)	33 (32.7)	18 (17.8)	2 (2.0)
The development of creativity through training	1 (1.0)	6 (5.9)	27 (26.7)	49 (48.5)	18 (17.8)
High achievement due to high motivation than high IQ	0 (0.0)	8 (7.9)	24 (23.8)	42 (41.6)	27 (26.7)
Success due to psychosocial factors than innate abilities	2 (2.0)	25 (24.8)	31 (30.7)	39 (38.6)	4 (4.0)
*Focus learning and practices on the specialized domain as soon as possible	11 (10.9)	57 (56.4)	21 (20.8)	9 (8.9)	3 (3.0)
The enjoyable involvement than developing skills	0 (0.0)	1 (1.0)	18 (17.8)	53 (52.5)	29 (28.7)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

Table G4

The Perceptions of Korean Elementary Teachers with Teaching Experience of 4-8 Years (n = 150) about TCGiftedness

The Survey Items	**Strongly Disagree**	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
*98th percentile in all subjects	36 (24.0)	77 (51.3)	25 (16.7)	9 (6.0)	3 (2.0)
*High IQ over 130	8 (5.3)	24 (16.0)	57 (38.0)	52 (34.7)	9 (6.0)
Excellent Performance only in one domain	2 (1.3)	8 (5.3)	10 (6.7)	74 (49.3)	56 (37.3)
High capabilities in linguistic intelligence	3 (2.0)	17 (11.3)	44 (29.3)	57 (38.0)	29 (19.3)
High capabilities in mathematic intelligence	2 (1.3)	5 (4.0)	30 (20.7)	66 (44.0)	47 (31.3)
High capabilit ies in spatial intelligence	2 (1.3)	6 (4.0)	31 (20.7)	67 (44.7)	44 (29.3)
Leadership ability or potential	2 (1.3)	17 (11.3)	47 (31.3)	64 (42.7)	20 (13.3)
Drama ability or potential	4 (2.7)	17 (11.3)	45 (30.0)	57 (38.0)	27 (18.0)
*No much change in the amount of intelligence	12 (8.0)	70 (46.7)	38 (25.3)	26 (17.3)	4 (2.7)
*Intelligence	13	39	55	32	11

as something without much change	(8.7)	(26.0)	(36.7)	(21.3)	(7.3)
*No much change in basic intelligence	6 (4.0)	52 (34.7)	52 (34.7)	33 (22.0)	7 (4.7)
The development of creativity through training	2 (1.3)	11 (7.3)	38 (25.3)	78 (52.0)	21 (14.0)
High achievement due to high motivation than high IQ	0 (0.0)	11 (7.3)	32 (21.3)	71 (47.3)	36 (24.0)
Success due to psychosocial factors than innate abilities	3 (2.0)	31 (20.7)	58 (38.7)	41 (27.3)	17 (11.3)
*Focus learning and practices on the specialized domain as soon as possible	17 (11.3)	67 (44.7)	35 (23.3)	25 (16.7)	6 (4.0)
The enjoyable involvement than developing skills	0 (0.0)	5 (3.3)	32 (21.3)	77 (51.3)	36 (24.0)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

Table G5

The Perceptions of Korean Elementary Teachers with Teaching Experience of 9-12 Years (n = 96) about TCGiftedness

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
*98th percentile in all subjects	13 (13.5)	56 (58.3)	16 (16.7)	10 (10.4)	1 (1.0)
*High IQ over 130	0 (0.0)	18 (18.8)	36 (37.5)	36 (37.5)	6 (6.3)
Excellent Performance only in one domain	1 (1.0)	3 (3.1)	15 (15.6)	42 (43.8)	35 (36.5)
High capabilities in linguistic intelligence	2 (2.1)	16 (16.7)	22 (22.9)	38 (39.6)	18 (18.8)
High capabilities in mathematic intelligence	1 (1.0)	4 (4.2)	19 (19.8)	44 (45.8)	28 (29.2)
High capabilities in spatial intelligence	1 (1.0)	6 (6.3)	18 (18.8)	48 (50.0)	23 (24.0)
Leadership ability or potential	2 (2.1)	13 (13.5)	31 (32.3)	32 (33.3)	18 (18.8)
Drama ability or potential	2 (2.1)	10 (10.4)	31 (32.3)	34 (35.4)	19 (19.8)
*No much change in the amount of intelligence	7 (7.3)	49 (51.0)	32 (33.3)	8 (8.3)	0 (0.0)

*Intelligence as something without much change	6 (6.3)	28 (29.2)	41 (42.7)	19 (19.8)	2 (2.1)
*No much change in basic intelligence	5 (5.2)	41 (42.7)	34 (35.4)	15 (15.6)	1 (1.0)
The development of creativity through training	1 (1.0)	8 (8.3)	30 (31.3)	51 (53.1)	6 (6.3)
High achievement due to high motivation than high IQ	0 (0.0)	3 (3.1)	16 (16.7)	44 (45.8)	33 (34.4)
Success due to psychosocial factors than innate abilities	1 (1.0)	15 (15.6)	34 (35.4)	35 (36.5)	11 (11.5)
*Focus learning and practices on the specialized domain as soon as possible	9 (9.4)	45 (46.9)	23 (24.0)	17 (17.7)	2 (2.1)
The enjoyable involvement than developing skills	1 (1.0)	1 (1.0)	13 (13.5)	59 (61.5)	22 (22.9)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

Table G6

The Perceptions of Korean Elementary Teachers with Teaching Experience of 13+ Years (n = 486) about TCGiftedness

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
*98th percentile in all subjects	60 (12.3)	220 (45.3)	137 (28.2)	60 (12.3)	9 (1.9)
*High IQ over 130	13 (2.7)	81 (16.7)	163 (33.5)	187 (38.5)	42 (8.6)
Excellent Performance only in one domain	7 (1.4)	26 (5.3)	87 (17.9)	225 (46.3)	141 (29.0)
High capabilities in linguistic intelligence	6 (1.2)	94 (19.3)	139 (28.4)	175 (36.2)	72 (14.8)
High capabilities in mathematic intelligence	2 (0.4)	28 (5.8)	112 (23.0)	237 (48.8)	107 (22.0)
High capabilities in spatial intelligence	0 (0.0)	30 (6.2)	103 (21.2)	262 (53.9)	91 (18.7)
Leadership ability or potential	4 (0.8)	91 (18.7)	153 (31.5)	184 (37.9)	54 (11.1)
Drama ability or potential	11 (2.3)	73 (15.0)	156 (32.1)	189 (38.9)	57 (11.7)
*No much change in the amount of intelligence	23 (4.7)	241 (49.6)	133 (27.4)	86 (17.7)	3 (0.6)

*Intelligence as something without much change	21 (4.3)	162 (33.3)	194 (39.9)	100 (20.6)	9 (1.9)
*No much change in basic intelligence	23 (4.7)	210 (43.2)	167 (34.4)	75 (15.4)	11 (2.3)
The development of creativity through training	3 (0.6)	37 (7.6)	135 (27.8)	272 (56.0)	39 (8.0)
High achievement due to high motivation than high IQ	1 (0.2)	21 (4.3)	105 (21.6)	225 (46.3)	134 (27.6)
Success due to psychosocial factors than innate abilities	5 (1.0)	83 (17.1)	194 (39.9)	157 (32. 3)	47 (9.7)
*Focus learning and practices on the specialized domain as soon as possible	41 (8.4)	220 (45.3)	113 (23.3)	79 (16.3)	33 (6.8)
The enjoyable involvement than developing skills	5 (1.0)	8 (1.6)	96 (19.8)	248 (51.0)	129 (26.5)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

Table G7

The Perceptions of Korean Elementary Teachers with Professional Development (n = 197) about TCGiftedness

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
*98thpercentile in all subjects	38 (19.3)	97 (49.2)	44 (22.3)	16 (8.1)	2 (1.0)
*High IQ over 130	5 (2.5)	37 (18.8)	80 (40.6)	65 (33.0)	10 (5.1)
Excellent Performance only in one domain	2 (1.0)	9 (4.6)	27 (13.7)	85 (43.1)	74 (37.6)
High capabilities in linguistic intelligence	3 (1.5)	25 (12.7)	53 (26.9)	75 (38.1)	41 (20.8)
High capabilities in mathematic intelligence	2 (1.0)	10 (5.1)	35 (17.8)	88 (44.7)	62 (31.5)
High capabilities in spatial intelligence	1 (0.5)	8 (4.1)	34 (17.3)	98 (49.7)	56 (28.4)
Leadership ability or potential	2 (1.0)	24 (12.2)	56 (28.4)	84 (42.6)	31 (15.7)
Drama ability or potential	3 (1.5)	26 (13.2)	50 (25.4)	83 (42.1)	35 (17.8)
*No much change in the amount of intelligence	17 (8.6)	94 (47.7)	55 (27.9)	29 (14.7)	2 (1.0)

*Intelligence as something without much change	15 (7.6)	70 (35.5)	70 (35.5)	35 (17.8)	7 (3.6)
*No much change in basic intelligence	9 (4.6)	90 (45.7)	61 (31.0)	33 (16.8)	4 (2.0)
The development of creativity through training	1 (0.5)	13 (6.6)	51 (25.9)	108 (54.8)	24 (12.2)
High achievement due to high motivation than high IQ	1 (0.5)	10 (5.1)	32 (16.2)	91 (46.2)	63 (32.0)
Success due to psychosocial factors than innate abilities	3 (1.5)	40 (20.3)	68 (34.5)	63 (32. 0)	23 (11.7)
*Focus learning and practices on the specialized domain as soon as possible	22 (11.2)	85 (43.1)	45 (22.8)	33 (16.8)	12 (6.1)
The enjoyable involvement than developing skills	1 (0.5)	5 (2.5)	31 (15.7)	108 (54.8)	52 (26.4)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

Table G8

The Perceptions of Korean Elementary Teachers without Professional Development (n = 636) about TCGiftedness

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
*98th percentile in all subjects	86 (13.5)	320 (50.3)	151 (23.7)	65 (10.2)	14 (2.2)
*High IQ over 130	20 (3.1)	101 (15.9)	219 (34.4)	244 (38.4)	52 (8.2)
Excellent Performance only in one domain	8 (1.3)	31 (4.9)	95 (14.9)	305 (48.0)	197 (31.0)
High capabilities in linguistic intelligence	10 (1.6)	112 (17.6)	184 (28.9)	239 (37.6)	91 (14.3)
High capabilities in mathematic intelligence	3 (0.5)	32 (5.0)	141 (22.2)	316 (49.7)	144 (22.6)
High capabilities in spatial intelligence	2 (0.3)	39 (6.1)	136 (21.4)	333 (52.4)	126 (19.8)
Leadership ability or potential	8 (1.3)	106 (16.7)	206 (32.4)	242 (38.1)	74 (11.6)
Drama ability or potential	15 (2.4)	88 (13.8)	212 (33.3)	240 (37.7)	81 (12.7)
*No much change in the amount of intelligence	34 (5.3)	322 (50.6)	172 (27.0)	101 (15.9)	7 (1.1)

*Intelligence as something without much change	34 (5.3)	199 (31.3)	251 (39.5)	134 (21.1)	18 (2.8)
*No much change in basic intelligence	30 (4.7)	256 (40.3)	225 (35.4)	108 (17.0)	17 (2.7)
The development of creativity through training	5 (0.8)	49 (7.7)	179 (28.1)	343 (54.0)	60 (9.4)
High achievement due to high motivation than high IQ	0 (0.0)	33 (5.2)	145 (23.0)	291 (45.6)	167 (26.3)
Success due to psychosocial factors than innate abilities	8 (1.3)	114 (17.9)	249 (39.2)	209 (32. 9)	56 (8.8)
*Focus learning and practices on the specialized domain as soon as possible	55 (8.6)	305 (48.0)	147 (23.1)	97 (15.3)	32 (5.0)
The enjoyable involvement than developing skills	5 (0.8)	10 (1.6)	128 (20.1)	330 (51.9)	163 (25.6)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

Table G9

The Perceptions of Korean Elementary Teachers with Gifted Programs (n = 405) in the Schools about TCGiftedness

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
*98th percentile in all subjects	63 (15.6)	198 (48.9)	94 (23.2)	43 (10.6)	7 (1.7)
*High IQ over 130	13 (3.2)	79 (19.5)	140 (34.6)	143 (35.3)	30 (7.4)
Excellent performance only in one domain	7 (1.7)	21 (5.2)	50 (12.3)	191 (47.2)	136 (33.6)
High capabilities in linguistic intelligence	7 (1.7)	57 (14.1)	109 (26.9)	161 (39.8)	71 (17.5)
High capabilities in mathematic intelligence	2 (0.5)	15 (3.7)	79 (19.5)	198 (48.8)	111 (27.4)
High capabilities in spatial intelligence	1 (0.2)	20 (4.9)	69 (17.0)	213 (52.6)	102 (25.2)
Leadership ability potential	2 (0.5)	46 (11.4)	132 (32.6)	169 (41.7)	56 (13.8)
Drama ability potential	5 (1.2)	46 (11.4)	124 (30.6)	166 (41.0)	64 (15.8)
*Not much change in the amount of intelligence	28 (6.9)	200 (49.4)	120 (29.6)	55 (13.6)	2 (0.5)
*Intelligence as something without much	25 (6.2)	137 (33.8)	157 (38.8)	74 (18.3)	12 (3.0)

change					
*Not much change in basic intelligence	20 (4.9)	166 (41.0)	152 (37.5)	59 (14.6)	8 (2.0)
The development of creativity through training	4 (1.0)	28 (6.9)	100 (24.7)	228 (56.3)	45 (11.1)
High achievement due to high motivation than high IQ	0 (0.0)	15 (3.7)	82 (20.2)	190 (46.9)	118 (29.1)
Success due to psychosocial factors than innate abilities	1 (0.2)	74 (18.3)	164 (40.5)	124 (30.6)	42 (10.4)
*Focus learning and practices on the specialized domain	35 (8.6)	199 (49.1)	80 (19.8)	71 (17.5)	20 (4.9)
The enjoyable involvement than developing skills	1 (0.2)	6 (1.5)	78 (19.3)	205 (50.6)	115 (28.4)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

Table G10

The Perceptions of Korean Elementary Teachers without Implementation of Gifted Programs (n = 135) in the Schools about TCGiftedness

The Survey Items	**Strongly Disagree**	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
*98th percentile in all subjects	29 (21.5)	65 (48.1)	27 (20.0)	12 (8.9)	2 (1.5)
*High IQ over 130	5 (3.7)	20 (14.8)	44 (32.6)	55 (40.7)	11 (8.1)
Excellent performance only in one domain	0 (0.0)	4 (3.0)	15 (11.1)	64 (47.4)	52 (38.5)
High capabilities in linguistic intelligence	1 (0.7)	23 (17.0)	36 (26.7)	46 (34.0)	29 (21.5)
High capabilities in mathematic intelligence	0 (0.0)	6 (4.4)	20 (14.8)	66 (48.9)	43 (31.9)
High capabilities in spatial intelligence	0 (0.0)	4 (3.0)	23 (17.0)	70 (51.9)	38 (28.1)
Leadership ability or Potential	2 (1.5)	28 (20.7)	27 (20.0)	55 (40.7)	23 (17.0)
Drama ability or potential	6 (4.4)	19 (14.1)	29 (21.5)	55 (40.7)	26 (19.3)
*Not much change in the amount of intelligence	8 (5.9)	72 (53.3)	25 (18.5)	27 (20.0)	3 (2.2)
*Intelligence as something	5 (3.7)	46 (34.1)	45 (33.3)	33 (24.4)	6 (4.4)

without much change					
*Not much change in basic intelligence	4 (3.0)	62 (45.9)	39 (28.9)	24 (17.8)	6 (4.4)
The development of creativity through training	1 (0.7)	6 (4.4)	33 (24.4)	82 (60.7)	13 (9.6)
High achievement due to high motivation than high IQ	1 (0.7)	7 (5.2)	26 (19.3)	60 (44.4)	41 (30.4)
Success due to psychosocial factors than innate abilities	3 (2.2)	20 (14.8)	44 (32.6)	50 (37.0)	18 (13.3)
*Focus learning and practices on the specialized domain	23 (17.0)	53 (39.3)	31 (23.0)	18 (13.3)	10 (7.4)
The enjoyable involvement than developing skills	1 (0.7)	1 (0.7)	15 (11.1)	77 (57.0)	41 (30.4)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

Table G11

The Perceptions of Korean Elementary Teachers without knowledge about the implementation of Gifted Programs in the Schools (n = 273) about TCGiftedness

The Survey Items	**Strongly Disagree**	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
*98th percentile in all subjects	30 (11.0)	145 (53.1)	66 (24.2)	25 (9.2)	7 (2.6)
*High IQ over 130	7 (2.6)	36 (13.2)	108 (39.6)	101 (37.0)	21 (7.7)
Excellent performance only in one domain	2 (0.7)	12 (4.4)	52 (19.0)	128 (46.9)	79 (28.9)
High capabilities in linguistic intelligence	4 (1.5)	52 (19.0)	87 (31.9)	98 (35.9)	32 (11.7)
High capabilities in mathematic intelligence	1 (0.4)	19 (7.7)	72 (26.4)	131 (48.0)	50 (18.3)
High capabilities in spatial intelligence	1 (0.4)	21 (7.7)	71 (26.0)	139 (50.9)	41 (15.0)
Leadership ability or potential	5 (1.8)	53 (19.4)	93 (34.1)	96 (35.2)	26 (9.5)
Drama ability or potential	6 (2.2)	46 (16.8)	97 (35.5)	98 (35.9)	26 (9.5)
*No much change in the amount of intelligence	14 (5.1)	133 (48.7)	75 (27.5)	47 (17.2)	4 (1.5)
*Intelligence as something	18 (6.6)	81 (29.7)	107 (39.2)	60 (22.0)	7 (2.6)

without much change					
*Not much change in basic intelligence	14 (5.1)	112 (41.0)	85 (31.1)	55 (20.1)	7 (2.6)
The development of creativity through training	2 (0.7)	27 (9.9)	88 (32.2)	130 (47.7)	26 (9.5)
High achievement due to high motivation than high IQ	0 (0.0)	19 (7.0)	65 (23.8)	119 (43.6)	70 (25.6)
Success due to psychosocial factors than innate abilities	7 (2.6)	57 (20.9)	102 (37.4)	88 (32.2)	19 (7.0)
*Focus learning and practices on the specialized domain	19 (7.0)	127 (46.5)	76 (27.8)	37 (13.6)	14 (5.1)
The enjoyable involvement than developing skills	4 (1.5)	6 (2.2)	60 (22.0)	145 (53.1)	58 (21.2)

Note: Same asterisk (*) indicate that those items are represented in their original form, prior to reverse coding.

APPENDIX H

THE FREQUENCY AND PERCENTAGE OF RESPONSES IN DIVERSE DEMOGRAPHICS IN THE SURVEY ITEMS RELATED TO TALENT DEVELOPMENT SUPPORT

This table shows number and percentage of teachers agreeing with each item of the survey related to Talent Development Support (TDS).

Table H1

The Perceptions of Korean Elementary Teachers from Lower Grades (n = 352) about TDS

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
The start of formal identification as soon as possible	14 (4.0)	111 (31.5)	117 (33.2)	86 (24.4)	24 (6.8)
The elimination of mastered curricular materials	24 (6.8)	136 (38.6)	95 (27.0)	84 (23.9)	13 (3.7)
The assignment of enrichment work	20 (5.7)	98 (27.8)	94 (26.7)	116 (33.0)	24 (6.8)
Teaching strategies to elicit high-level thinking	2 (0.6)	25 (7.1)	84 (23.9)	189 (53.7)	52 (14.8)
The assignment of different homework	5 (1.4)	52 (14.8)	98 (27.8)	156 (44.3)	41 (11.6)

The lesson for creativity within regular curriculum	47 (13.4)	172 (48.9)	75 (21.3)	52 (14.8)	6 (1.7)
The implementation of pull-out programs	6 (1.7)	27 (7.7)	69 (19.6)	160 (45.5)	90 (25.6)
Systematic programs for nonacademic domain talent during regular hours	33 (9.4)	167 (47.4)	99 (27.8)	50 (14.2)	4 (1.1)
The increase of frequency for daily challenges	9 (2.6)	58 (16.5)	119 (33.8)	137 (38.9)	29 (8.2)
Free programs for all students to develop nonacademic talent	45 (12.8)	143 (40.6)	90 (25.6)	62 (17.6)	12 (3.4)
The employment of out-of school gifted programs	3 (0.9)	13 (3.7)	68 (19.3)	191 (54.3)	77 (21.9)
Grouping by ability in the class	26 (7.4)	86 (24.4)	122 (34.7)	103 (29.3)	15 (4.3)
Grouping by interest	22 (6.3)	60 (17.0)	119 (33.8)	123 (34.9)	28 (8.0)
Pull-out programs	14 (4.0)	24 (6.8)	78 (22.2)	168 (47.7)	68 (19.3)
After school programs in more diverse domains	1 (0.3)	7 (2.0)	66 (18.8)	194 (55.1)	84 (23.9)
The after-	1	5	62	191	93

school programs by out-of-school professionals in nonacademic domains	(0.3)	(1.4)	(17.6)	(54.3)	(26.4)
Mentorship	2 (0.6)	4 (1.1)	69 (19.6)	190 (54.0)	87 (24.7)
Field trip to professionals	2 (0.6)	5 (1.4)	68 (19.3)	189 (53.7)	88 (25.0)
Special schools for talent development	8 (2.3)	20 (5.7)	83 (23.6)	164 (46.6)	77 (21.9)
Online learning	1 (0.3)	44 (12.5)	115 (32.7)	152 (43.2)	40 (11.4)
Creativity training programs	1 (0.3)	44 (12.5)	115 (32.7)	152 (43.2)	40 (11.4)
Training programs for psychological skills	1 (0.3)	7 (25.3)	75 (43.8)	200 (6.0)	69 (19.6)
The presentation of talents	8 (2.3)	20 (2.0)	90 (21.3)	188 (56.8)	46 (19.6)
Participation in competitions	8 (2.3)	14 (4.0)	87 (24.7)	189 (53.7)	54 (15.3)

Table H2

The Perceptions of Korean Elementary Teachers from Upper Grades (n = 420) about TDS

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
The start of formal identification as soon as possible	23 (5.5)	160 (38.1)	126 (30.0)	84 (20.0)	27 (6.4)
The elimination of mastered curricular materials	28 (6.7)	167 (39.8)	101 (24.0)	105 (25.0)	19 (4.5)
The assignment of enrichment work	25 (6.0)	121 (28.8)	136 (32.4)	110 (26.2)	28 (6.7)
Teaching strategies to elicit high-level thinking	5 (1.2)	20 (4.8)	121 (28.8)	197 (46.9)	77 (18.3)
The assignment of different homework	9 (2.1)	44 (10.5)	153 (36.4)	155 (36.9)	59 (14.0)
The lesson for creativity within regular curriculum	53 (12.6)	212 (50.5)	80 (19.0)	65 (15.5)	10 (2.4)
The implementation of pull-out programs	12 (2.9)	37 (8.8)	81 (19.3)	175 (41.7)	115 (27.3)
Systematic programs for nonacademic domain talent during regular hours	32 (7.6)	192 (45.7)	110 (26.2)	70 (16.7)	16 (3.8)
The increase of	13	54	141	165	47

frequency for daily challenges	(3.1)	(12.9)	(33.6)	(39.3)	(11.2)
Free programs for all students to develop nonacademic talent	42 (10.0)	157 (37.4)	115 (27.4)	80 (19.0)	26 (6.2)
The employment of out-of school gifted programs	7 (1.7)	14 (3.3)	91 (21.7)	207 (49.3)	101 (24.0)
Grouping by ability in the class	22 (5.2)	117 (27.9)	130 (31.0)	117 (27.9)	34 (8.1)
Grouping by interest	14 (3.3)	72 (17.1)	120 (28.6)	153 (36.4)	61 (14.5)
Pull-out programs	9 (2.1)	32 (7.6)	97 (23.1)	178 (42.4)	104 (24.8)
After school programs in more diverse domains	5 (1.2)	12 (2.9)	90 (21.4)	204 (48.6)	109 (26.0)
The after-school programs by out-of-school professionals in nonacademic domains	1 (0.2)	17 (4.0)	76 (18.1)	199 (47.1)	127 (30.2)
Mentorship	2 (0.5)	12 (2.9)	88 (21.0)	191 (45.5)	127 (30.2)
Field trip to professionals	1 (0.2)	17 (4.0)	68 (16.2)	196 (46.7)	138 (32.9)
Special schools for talent development	4 (1.0)	39 (9.3)	101 (24.0)	161 (38.3)	115 (27.4)
Online learning	9 (1.9)	59 (14.0)	120 (28.6)	158 (37.6)	75 (17.9)
Creativity training programs	1 (0.2)	13 (3.1)	99 (23.6)	196 (46.7)	111 (26.4)

Training programs for psychological skills	1 (0.2)	16 (3.8)	90 (21.4)	188 (44.8)	125 (29.8)
The presentation of talents	6 (1.4)	29 (6.9)	116 (27.6)	172 (41.0)	97 (23.1)
Participation in competitions	8 (1.9)	28 (6.7)	111 (26.4)	169 (40.3)	104 (24.8)

Table H3

The Perceptions of Korean Elementary Teachers with 1-3 years of teaching experience (n = 101) about TDS

The Survey Items	**Strongly Disagree**	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
The start of formal identification as soon as possible	3 (3.0)	36 (35.6)	28 (27.7)	28 (27.7)	6 (5.9)
The elimination of mastered curricular materials	16 (15.8)	50 (49.5)	22 (21.8)	10 (9.9)	3 (3.0)
The assignment of enrichment work	5 (5.0)	28 (27.7)	37 (36.6)	24 (23.8)	7 (6.9)
Teaching strategies to elicit high-level thinking	0 (0.0)	3 (3.0)	22 (21.8)	51 (50.5)	25 (24.8)
The assignment of different homework	1 (1.0)	8 (7.9)	31 (30.7)	41 (40.6)	20 (19.8)
The lesson for creativity within regular curriculum	8 (7.9)	48 (47.5)	26 (25.7)	16 (15.8)	3 (3.0)
The implementation of pull-out programs	1 (1.0)	9 (8.9)	23 (22.8)	41 (40.6)	27 (26.7)
Systematic programs for nonacademic domain talent during regular hours	8 (7.9)	39 (38.6)	32 (31.7)	17 (16.8)	5 (5.0)

The increase of frequency for daily challenges	3 (1.0)	13 (8.9)	38 (22.8)	41 (40.6)	6 (5.9)
Free programs for all students to develop nonacademic talent	5 (5.0)	45 (44.6)	35 (34.7)	13 (12.9)	3 (3.0)
The employment of out-of school gifted programs	0 (0.0)	1 (1.0)	24 (23.8)	59 (58.4)	17 (16.8)
Grouping by ability in the class	5 (5.0)	25 (24.8)	36 (35.7)	30 (29.7)	5 (5.0)
Grouping by interest	4 (4.0)	16 (15.8)	30 (29.7)	36 (35.6)	15 (14.9)
Pull-out programs	2 (2.0)	9 (8.9)	24 (23.8)	45 (44.6)	21 (20.8)
After school programs in more diverse domains	0 (0.0)	1 (1.0)	22 (21.8)	52 (51.5)	26 (25.7)
The after-school programs by out-of-school professionals in nonacademic domains	0 (0.0)	4 (4.0)	13 (12.9)	58 (57.4)	26 (25.7)
Mentorship	2 (2.0)	1 (1.0)	17 (16.8)	56 (55.4)	25 (24.8)
Field trip to professionals	0 (0.0)	1 (1.0)	13 (12.9)	55 (54.5)	32 (31.7)
Special schools for talent development	2 (2.0)	12 (11.9)	27 (26.7)	37 (36.6)	23 (27.8)
Online learning	3 (3.0)	14 (13.9)	31 (30.7)	39 (38.6)	14 (13.9)

Creativity training programs	0 (0.0)	2 (2.0)	15 (14.9)	57 (56.4)	27 (26.7)
Training programs for psychological skills	0 (0.0)	1 (1.0)	19 (18.8)	52 (51.5)	29 (28.7)
The presentation of talents	1 (1.0)	7 (6.9)	25 (24.8)	40 (39.6)	28 (27.7)
Participation in competitions	1 (1.0)	2 (2.0)	24 (23.8)	56 (55.5)	18 (17.8)

Table H4

The Perceptions of Korean Elementary Teachers with 4-8 years of teaching experience (n = 150) about TDS

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
The start of formal identification as soon as possible	8 (5.3)	55 (36.7)	50 (33.3)	31 (20.7)	6 (4.0)
The elimination of mastered curricular materials	12 (8.0)	65 (43.3)	37 (24.7)	28 (18.7)	8 (5.3)
The assignment of enrichment work	14 (9.3)	59 (39.3)	35 (23.3)	34 (22.7)	8 (5.3)
Teaching strategies to elicit high-level thinking	3 (2.0)	4 (2.7)	34 (22.7)	86 (57.3)	23 (15.3)
The assignment of different homework	7 (4.7)	17 (11.3)	53 (35.3)	59 (39.3)	14 (9.3)
The lesson for creativity within regular curriculum	32 (21.3)	69 (46.0)	28 (18.7)	16 (10.7)	5 (3.3)
The implementation of pull-out programs	3 (2.0)	12 (8.0)	23 (15.3)	62 (41.3)	50 (33.3)
Systematic programs for nonacademic domain talent during regular hours	14 (9.3)	67 (44.7)	47 (31.3)	20 (13.3)	2 (1.3)

The increase of frequency for daily challenges	3 (2.0)	25 (16.7)	48 (32.0)	55 (36.7)	19 (12.7)
Free programs for all students to develop nonacademic talent	22 (14.7)	52 (34.7)	45 (30.0)	22 (14.7)	9 (6.0)
The employment of out-of school gifted programs	0 (0.0)	7 (4.7)	24 (16.0)	72 (48.0)	47 (31.3)
Grouping by ability in the class	9 (6.0)	39 (26.0)	50 (33.3)	39 (26.0)	13 (8.7)
Grouping by interest	5 (3.3)	27 (18.0)	46 (30.7)	51 (34.0)	21 (14.0)
Pull-out programs	0 (0.0)	5 (3.3)	35 (23.3)	73 (48.7)	37 (24.7)
After school programs in more diverse domains	1 (0.7)	1 (0.7)	28 (18.7)	77 (51.3)	43 (28.7)
The after-school programs by out-of-school professionals in nonacademic domains	1 (0.0)	4 (4.0)	26 (12.9)	70 (57.4)	49 (25.7)
Mentorship	1 (0.7)	2 (1.3)	28 (18.7)	70 (46.7)	49 (32.7)
Field trip to professionals	2 (1.3)	2 (1.3)	25 (16.7)	70 (46.7)	51 (34.0)
Special schools for talent development	1 (0.7)	11 (7.3)	33 (22.0)	60 (40.0)	45 (30.0)
Online learning	1 (0.7)	24 (16.0)	48 (32.0)	52 (34.7)	25 (16.7)

Creativity training programs	2 (1.3)	4 (2.7)	37 (24.7)	71 (47.3)	36 (30.7)
Training programs for psychological skills	1 (0.7)	5 (3.3)	33 (22.0)	65 (43.3)	46 (30.7)
The presentation of talents	1 (1.0)	8 (6.9)	46 (24.8)	66 (39.6)	29 (27.7)
Participation in competitions	1 (0.7)	4 (2.7)	40 (26.7)	69 (46.0)	36 (24.0)

Table H5

The Perceptions of Korean Elementary Teachers with 9-12 years of teaching experience (n = 96) about TDS

The Survey Items	**Strongly Disagree**	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
The start of formal identification as soon as possible	4 (4.2)	33 (34.4)	39 (40.6)	15 (15.6)	5 (5.2)
The elimination of mastered curricular materials	3 (3.1)	39 (40.6)	24 (25.0)	27 (28.1)	3 (3.1)
The assignment of enrichment work	5 (5.2)	29 (30.2)	37 (38.5)	21 (21.9)	4 (4.2)
Teaching strategies to elicit high-level thinking	2 (2.1)	4 (4.2)	33 (34.4)	40 (41.7)	17 (17.7)
The assignment of different homework	2 (2.1)	8 (8.3)	40 (41.7)	38 (39.6)	8 (8.3)
The lesson for creativity within regular curriculum	11 (11.5)	48 (51.0)	1 (25.0)	24 (11.5)	11 (1.0)
The implementation of pull-out programs	2 (2.1)	9 (9.4)	15 (15.6)	50 (52.1)	20 (20.8)
Systematic programs for nonacademic domain talent during regular hours	9 (9.4)	42 (43.8)	29 (30.2)	15 (15.6)	1 (1.0)

The increase of frequency for daily challenges	4 (4.2)	12 (12.5)	35 (36.5)	38 (39.6)	7 (7.3)
Free programs for all students to develop nonacademic talent	11 (11.5)	43 (44.8)	23 (24.0)	16 (16.7)	3 (3.1)
The employment of out-of school gifted programs	0 (0.0)	2 (2.1)	27 (28.1)	51 (53.1)	16 (16.7)
Grouping by ability in the class	8 (5.2)	26 (27.9)	36 (31.0)	21 (27.9)	5 (8.1)
Grouping by interest	4 (4.2)	15 (15.6)	34 (35.4)	37 (38.5)	6 (6.3)
Pull-out programs	2 (2.1)	8 (8.3)	21 (21.9)	45 (46.9)	20 (20.8)
After school programs in more diverse domains	0 (0.0)	2 (2.1)	22 (22.9)	50 (52.1)	22 (22.9)
The after-school programs by out-of-school professionals in nonacademic domains	0 (0.0)	1 (1.0)	20 (20.8)	49 (51.0)	26 (27.1)
Mentorship	0 (0.0)	0 (0.0)	21 (21.9)	41 (42.7)	34 (35.4)
Field trip to professionals	0 (0.0)	2 (2.1)	16 (16.7)	48 (50.0)	30 (31.3)
Special schools for talent development	1 (1.0)	3 (3.1)	22 (22.9)	42 (43.8)	28 (29.2)
Online learning	1 (1.0)	10 (10.4)	28 (29.2)	36 (37.5)	21 (21.9)

Creativity training programs	0 (1.3)	4 (2.7)	23 (24.7)	43 (47.3)	26 (30.7)
Training programs for psychological skills	0 (0.0)	2 (2.1)	25 (26.0)	40 (41.7)	29 (30.2)
The presentation of talents	1 (1.0)	9 (9.4)	19 (19.8)	47 (49.0)	20 (20.8)
Participation in competitions	0 (0.0)	7 (7.3)	22 (22.9)	42 (43.8)	25 (26.0)

Table H6

The Perceptions of Korean Elementary Teachers with 13+ years of teaching experience (n = 486) about TDS

The Survey Items	**Strongly Disagree**	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
The start of formal identification as soon as possible	25 (5.1)	169 (34.8)	150 (30.9)	105 (21.6)	37 (7.6)
The elimination of mastered curricular materials	28 (5.8)	166 (34.2)	134 (27.6)	137 (28.2)	21 (4.3)
The assignment of enrichment work	25 (5.1)	120 (24.7)	140 (28.8)	163 (33.5)	38 (7.8)
Teaching strategies to elicit high-level thinking	4 (0.8)	38 (7.8)	130 (26.7)	236 (48.6)	78 (16.0)
The assignment of different homework	5 (1.0)	72 (14.8)	147 (30.2)	193 (39.7)	59 (14.2)
The lesson for creativity within regular curriculum	57 (11.7)	248 (51.0)	92 (18.9)	81 (16.7)	8 (1.6)
The implementation of pull-out programs	13 (2.7)	41 (8.4)	103 (21.2)	207 (42.6)	122 (25.1)
Systematic programs for nonacademic domain talent during regular hours	39 (8.0)	232 (47.7)	121 (24.9)	79 (16.3)	15 (3.1)

The increase of frequency for daily challenges	14 (2.9)	73 (15.0)	164 (33.7)	189 (38.9)	46 (9.5)
Free programs for all students to develop nonacademic talent	56 (11.5)	178 (36.6)	121 (24.9)	105 (21.6)	26 (5.3)
The employment of out-of school gifted programs	10 (2.1)	19 (3.9)	102 (21.0)	245 (50.4)	110 (22.6)
Grouping by ability in the class	30 (6.2)	125 (25.7)	157 (32.3)	146 (30.0)	28 (5.8)
Grouping by interest	26 (5.3)	85 (17.5)	151 (31.1)	173 (35.6)	51 (10.5)
Pull-out programs	20 (4.1)	39 (8.0)	112 (23.0)	211 (43.4)	104 (21.4)
After school programs in more diverse domains	5 (1.0)	17 (3.5)	101 (20.8)	252 (51.9)	111 (22.8)
The after-school programs by out-of-school professionals in nonacademic domains	1 (0.2)	15 (3.1)	95 (19.5)	244 (50.2)	131 (27.0)
Mentorship	1 (0.2)	14 (2.9)	106 (21.8)	245 (50.4)	120 (24.7)
Field trip to professionals	1 (0.2)	19 (3.9)	93 (19.1)	245 (50.4)	120 (26.3)
Special schools for talent development	9 (1.9)	37 (7.6)	119 (24.5)	212 (43.6)	109 (22.4)
Online learning	5 (1.0)	60 (12.3)	155 (31.9)	204 (42.0)	62 (12.8)

Creativity training programs	1 (0.2)	15 (3.1)	118 (24.3)	251 (51.6)	101 (20.8)
Training programs for psychological skills	1 (0.2)	15 (3.1)	107 (22.0)	263 (54.1)	100 (20.6)
The presentation of talents	11 (1.0)	32 (9.4)	130 (19.8)	239 (49.0)	74 (20.8)
Participation in competitions	14 (2.9)	32 (6.6)	129 (26.5)	224 (46.1)	87 (17.9)

Table H7

The Perceptions of Korean Elementary Teachers with Professional Development (n = 197) about TDS

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
The start of formal identification as soon as possible	8 (4.1)	61 (31.0)	66 (33.5)	48 (24.4)	14 (7.1)
The elimination of mastered curricular materials	12 (6.1)	74 (37.6)	50 (25.4)	52 (26.4)	9 (4.6)
The assignment of enrichment work	14 (7.1)	52 (26.4)	53 (26.9)	65 (33.0)	13 (6.6)
Teaching strategies to elicit high-level thinking	3 (1.5)	5 (2.5)	45 (22.8)	106 (53.8)	38 (19.3)
The assignment of different homework	5 (2.5)	18 (9.1)	68 (34.5)	82 (41.6)	24 (12.2)
The lesson for creativity within regular curriculum	22 (11.2)	98 (49.7)	38 (19.3)	38 (19.3)	1 (0.5)
The implementation of pull-out programs	5 (2.5)	20 (10.2)	28 (14.2)	86 (43.7)	58 (29.4)
Systematic programs for nonacademic domain talent during regular hours	18 (9.1)	90 (45.7)	41 (20.8)	44 (22.3)	4 (2.0)

The increase of frequency for daily challenges	5 (2.5)	17 (8.6)	66 (33.5)	87 (44.2)	22 (11.2)
Free programs for all students to develop nonacademic talent	27 (13.7)	68 (34.5)	51 (25.9)	41 (20.8)	10 (5.1)
The employment of out-of school gifted programs	3 (1.5)	8 (4.1)	35 (17.8)	107 (54.3)	44 (22.3)
Grouping by ability in the class	8 (4.1)	49 (24.9)	58 (29.4)	64 (32.5)	18 (9.1)
Grouping by interest	9 (4.6)	32 (16.2)	52 (26.4)	82 (41.6)	22 (11.2)
Pull-out programs	5 (2.5)	11 (5.6)	34 (17.3)	104 (52.8)	43 (21.8)
After school programs in more diverse domains	3 (1.5)	5 (2.5)	34 (17.3)	106 (53.8)	49 (24.9)
The after-school programs by out-of-school professionals in nonacademic domains	0 (0.0)	7 (3.6)	32 (16.2)	103 (52.3)	55 (27.9)
Mentorship	0 (0.0)	4 (2.0)	36 (18.3)	99 (50.3)	58 (29.4)
Field trip to professionals	1 (0.5)	4 (2.0)	30 (15.2)	99 (50.3)	63 (32.0)
Special schools for talent development	0 (0.0)	12 (6.1)	39 (19.8)	89 (45.2)	57 (28.9)
Online learning	4 (2.0)	27 (13.7)	50 (25.4)	78 (39.6)	38 (19.3)

Creativity training programs	1 (0.5)	6 (3.0)	32 (16.2)	105 (53.3)	53 (26.9)
Training programs for psychological skills	1 (0.5)	7 (3.6)	33 (16.8)	101 (51.3)	55 (27.9)
The presentation of talents	3 (1.5)	11 (5.6)	44 (22.3)	99 (50.3)	40 (20.3)
Participation in competitions	5 (2.5)	13 (7.6)	42 (21.3)	96 (48.7)	39 (19.8)

Table 8

The Perceptions of Korean Elementary Teachers without Professional Development (n = 636) about TDS

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
The start of formal identification as soon as possible	31 (4.9)	233 (36.6)	201 (31.6)	131 (20.6)	40 (6.3)
The elimination of mastered curricular materials	47 (7.4)	246 (38.7)	166 (26.1)	151 (23.7)	26 (4.1)
The assignment of enrichment work	35 (5.5)	184 (28.9)	195 (30.7)	178 (28.0)	44 (6.9)
Teaching strategies to elicit high-level thinking	6 (0.9)	44 (6.9)	173 (27.2)	308 (48.4)	105 (16.5)
The assignment of different homework	10 (1.6)	87 (13.7)	204 (32.1)	248 (39.0)	87 (13.7)
The lesson for creativity within regular curriculum	85 (13.4)	317 (49.9)	132 (20.8)	86 (13.5)	16 (2.5)
The implementation of pull-out programs	13 (2.0)	51 (8.0)	136 (21.4)	275 (43.2)	161 (25.4)
Systematic programs for nonacademic domain talent during regular hours	51 (7.6)	291 (45.7)	188 (26.2)	87 (16.7)	19 (3.8)

The increase of frequency for daily challenges	19 (3.0)	107 (16.8)	219 (34.4)	236 (37.1)	55 (8.6)
Free programs for all students to develop nonacademic talent	67 (10.5)	251 (39.5)	173 (27.2)	115 (18.1)	30 (4.7)
The employment of out-of school gifted programs	7 (1.1)	22 (3.5)	142 (22.3)	320 (50.4)	145 (22.8)
Grouping by ability in the class	44 (6.9)	166 (26.1)	220 (34.6)	173 (27.2)	33 (5.2)
Grouping by interest	30 (4.7)	111 (17.5)	209 (32.9)	215 (33.8)	71 (11.2)
Pull-out programs	19 (3.0)	50 (7.9)	158 (24.8)	270 (42.5)	139 (21.9)
After school programs in more diverse domains	3 (0.5)	16 (2.5)	138 (21.7)	326 (51.3)	153 (24.1)
The after-school programs by out-of-school professionals in nonacademic domains	2 (0.3)	17 (2.7)	122 (19.2)	318 (50.0)	177 (27.8)
Mentorship	4 (0.6)	13 (2.0)	136 (21.4)	313 (49.2)	170 (26.7)
Field trip to professionals	2 (0.3)	20 (3.1)	117 (18.4)	318 (50.2)	178 (28.0)
Special schools for talent development	13 (2.0)	51 (8.0)	162 (25.5)	263 (41.4)	147 (23.1)
Online learning	6 (0.9)	81 (12.7)	213 (33.5)	253 (39.8)	83 (13.1)

Creativity training programs	2 (0.3)	19 (3.0)	161 (25.3)	318 (50.0)	136 (21.4)
Training programs for psychological skills	1 (0.2)	16 (2.5)	151 (23.7)	320 (50.3)	148 (23.3)
The presentation of talents	11 (1.5)	45 (5.6)	177 (22.3)	293 (50.3)	110 (20.3)
Participation in competitions	11 (1.7)	30 (4.7)	173 (27.2)	296 (46.5)	126 (19.8)

Table 9

The Perceptions of Korean Elementary Teachers with Gifted Programs in the school (n = 405) about TDS

The Survey Items	**Strongly Disagree**	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
The start of formal identification as soon as possible	18 (4.4)	142 (35.1)	124 (30.6)	98 (24.2)	23 (5.7)
The elimination of mastered curricular materials	30 (7.4)	158 (39.0)	94 (23.2)	105 (25.9)	18 (4.4)
The assignment of enrichment work	21 (5.2)	123 (30.4)	105 (25.9)	124 (30.6)	32 (7.9)
Teaching strategies to elicit high-level thinking	2 (0.5)	22 (5.4)	95 (23.5)	204 (50.4)	82 (20.2)
The assignment of different homework	7 (1.7)	52 (12.8)	125 (30.9)	165 (40.7)	56 (13.8)
The lesson for creativity within regular curriculum	52 (12.8)	205 (50.6)	86 (21.2)	54 (13.3)	8 (2.0)
The implementation of pull-out programs	6 (1.5)	37 (9.1)	74 (18.3)	176 (43.5)	112 (27.4)
Systematic programs for nonacademic domain talent during regular hours	30 (7.4)	192 (47.4)	106 (26.2)	64 (15.8)	13 (3.2)

The increase of frequency for daily challenges	5 (1.2)	53 (13.1)	133 (32.8)	167 (41.2)	47 (11.6)
Free programs for all students to develop nonacademic talent	42 (10.4)	156 (38.5)	106 (26.2)	80 (19.8)	21 (5.2)
The employment of out-of school gifted programs	2 (0.5)	13 (3.2)	72 (17.8)	218 (53.8)	100 (24.7)
Grouping by ability in the class	18 (4.4)	113 (27.9)	132 (32.6)	117 (28.9)	25 (6.2)
Grouping by interest	13 (3.2)	75 (18.5)	116 (28.6)	153 (37.8)	48 (11.9)
Pull-out programs	8 (2.0)	28 (6.9)	79 (19.5)	196 (48.4)	94 (23.2)
After school programs in more diverse domains	3 (0.7)	8 (2.0)	77 (19.0)	211 (52.1)	106 (26.2)
The after-school programs by out-of-school professionals in nonacademic domains	1 (0.2)	9 (2.2)	62 (15.3)	210 (51.9)	123 (30.4)
Mentorship	1 (0.2)	7 (1.7)	68 (16.8)	209 (51.6)	120 (29.6)
Field trip to professionals	1 (0.2)	9 (2.2)	62 (15.3)	200 (49.4)	133 (32.8)
Special schools for talent development	7 (1.7)	22 (5.4)	91 (22.5)	181 (44.7)	104 (25.7)
Online learning	8	52	122	157	66

	(1.9)	(14.0)	(28.6)	(37.6)	(17.9)
Creativity training programs	0 (0.0)	12 (3.0)	88 (22.0)	197 (48.6)	107 (26.4)
Training programs for psychological skills	0 (0.0)	7 (1.7)	77 (19.0)	210 (51.9)	111 (27.4)
The presentation of talents	6 (1.5)	25 (6.2)	92 (22.7)	204 (50.4)	111 (27.4)
Participation in competitions	8 (2.0)	26 (6.4)	93 (23.0)	199 (49.1)	79 (19.5)

Table H10

The Perceptions of Korean Elementary Teachers without Gifted Programs in the schools (n = 135) about TDS

The Survey Items	**Strongly Disagree**	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
The start of formal identification as soon as possible	9 (6.7)	43 (31.9)	45 (33.3)	26 (19.3)	12 (8.9)
The elimination of mastered curricular materials	16 (11.9)	47 (34.8)	31 (23.0)	31 (23.0)	10 (7.4)
The assignment of enrichment work	10 (7.4)	35 (25.9)	41 (30.4)	39 (28.9)	10 (7.4)
Teaching strategies to elicit high-level thinking	2 (2.2)	5 (3.7)	27 (20.0)	73 (54.1)	27 (20.0)
The assignment of different homework	5 (3.7)	14 (10.4)	41 (30.4)	56 (41.5)	19 (14.1)
The lesson for creativity within regular curriculum	22 (16.3)	65 (48.1)	20 (14.8)	25 (18.5)	3 (2.2)
The implementation of pull-out programs	4 (3.0)	14 (10.4)	22 (16.3)	49 (36.3)	46 (34.1)
Systematic programs for nonacademic domain talent during regular hours	14 (10.4)	63 (46.7)	35 (25.9)	18 (13.3)	5 (3.7)

The increase of frequency for daily challenges	9 (6.7)	22 (16.3)	44 (32.6)	49 (36.3)	11 (8.1)
Free programs for all students to develop nonacademic talent	18 (13.3)	50 (37.0)	31 (23.0)	26 (19.3)	10 (7.4)
The employment of out-of school gifted programs	3 (2.2)	5 (3.7)	22 (16.3)	66 (48.8)	39 (28.9)
Grouping by ability in the class	14 (10.4)	32 (23.7)	32 (23.7)	47 (34.8)	10 (7.4)
Grouping by interest	13 (9.6)	21 (15.6)	34 (20.7)	51 (43.0)	16 (22.2)
Pull-out programs	10 (7.4)	9 (6.7)	28 (20.7)	58 (43.0)	30 (22.2)
After school programs in more diverse domains	3 (2.2)	3 (2.2)	16 (11.9)	77 (57.0)	36 (26.7)
The after-school programs by out-of-school professionals in nonacademic domains	1 (0.7)	6 (4.4)	19 (14.1)	69 (51.1)	40 (29.6)
Mentorship	2 (1.5)	2 (1.5)	28 (20.7)	67 (49.6)	36 (26.7)
Field trip to professionals	2 (0.7)	20 (2.2)	117 (16.3)	318 (52.6)	178 (28.1)
Special schools for talent development	1 (1.0)	9 (9.3)	28 (24.0)	62 (38.3)	35 (27.4)
Online learning	2 (1.5)	12 (8.9)	37 (27.4)	63 (46.7)	21 (15.6)

Creativity training programs	1 (0.2)	3 (2.2)	16 (11.9)	83 (61.5)	32 (23.7)
Training programs for psychological skills	1 (0.7)	7 (5.2)	38 (28.1)	65 (48.1)	24 (17.8)
The presentation of talents	1 (0.7)	7 (5.2)	38 (28.1)	65 (48.1)	24 (17.8)
Participation in competitions	11 (0.7)	30 (3.7)	173 (25.9)	296 (48.8)	126 (20.7)

Table 11

The Perceptions of Korean Elementary Teachers with no knowledge related to gifted programs in the school (n = 273) about TDS

The Survey Items	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
The start of formal identification	13 (4.8)	99 (36.3)	92 (33.7)	51 (18.7)	18 (6.6)
The elimination of mastered Curricular materials	13 (4.8)	107 (39.2)	83 (30.4)	63 (23.1)	7 (2.6)
The Assignment of enrichment work	18 (6.6)	75 (27.5)	92 (33.7)	73 (26.7)	15 (5.5)
Teaching strategies to elicit high level thinking	4 (1.5)	21 (7.7)	87 (31.9)	128 (46.9)	33 (12.1)
The assignment of different work	3 (1.1)	37 (13.6)	96 (35.2)	102 (37.4)	35 (12.8)
The lesson for creativity within regular curriculum	34 (12.5)	134 (49.1)	57 (20.9)	42 (15.4)	6 (2.2)
The implementation of pull-out program	9 (3.3)	20 (7.3)	61 (22.3)	124 (45.4)	59 (21.6)
Systematic programs for nonacademic domain talent during regular hours	26 (9.5)	115 (42.1)	80 (29.3)	47 (17.2)	5 (1.8)

The increase of frequency for daily challenges	10 (3.7)	46 (16.8)	99 (36.3)	99 (36.3)	19 (7.0)
Free programs for all students to develop nonacademic domain talent	34 (12.5)	99 (36.3)	82 (30.0)	48 (17.6)	10 (3.7)
The employment of out-of school gifted programs	5 (1.8)	12 (4.4)	77 (28.2)	130 (47.6)	49 (17.9)
Grouping by ability in the class	20 (7.3)	65 (23.8)	106 (38.9)	66 (24.2)	16 (5.9)
Grouping by interest	13 (4.8)	40 (14.7)	103 (37.8)	88 (32.2)	29 (10.6)
Pull-out programs	6 (2.4)	24 (8.8)	74 (27.1)	112 (41.0)	57 (20.9)
After-school problems in more diverse domains	0 (0.0)	9 (3.3)	70 (25.6)	134 (49.5)	60 (25.3)
The after-school programs by out-of school professionals in nonacademic domains	0 (0.0)	9 (3.3)	60 (22.0)	135 (49.5)	69 (25.3)
Mentorship	1 (0.4)	8 (2.9)	65 (23.8)	129 (47.3)	70 (25.6)
Field trip to professionals	1 (0.4)	11 (2.9)	55 (23.8)	139 (47.3)	67 (25.6)
Special schools	5	30	74	100	64

for talent development	(1.8)	(11.0)	(27.1)	(36.6)	(23.4)
Online learning	0 (0.0)	42 (15.4)	94 (34.4)	103 (37.7)	34 (12.5)
Creativity training programs	2 (0.7)	10 (3.7)	79 (28.9)	134 (49.1)	48 (17.6)
Training programs for psychological skills	1 (0.4)	11 (4.0)	73 (26.7)	130 (47.6)	58 (21.2)
The presentation of talents	6 (2.2)	24 (8.8)	81 (29.7)	114 (41.8)	48 (17.6)
Participation in competition	7 (2.6)	14 (5.1)	78 (28.6)	119 (43.6)	55 (20.1)

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Scholarly Activities

Scholarly Paper Presentations

Son, Y. E., & Mayfield, K. B. (2013, March). *Bridging the Gap: Connecting gifted and ESL education services in America's public schools(I).* Paper presented at the National Curriculum Network Conference, Williamsburg. .

Son, Y. E., & Schmit, A. M. (2013, October). *The perceptions of preservice teachers toward giftedness and gifted education.* Paper presented at the Critical Questions in Education Conference, San Antonio.

Son, Y. E., & Mayfield, K. B. (2013, November). *Bridging the Gap: Connecting gifted and ESL education services in America's public schools(II).* Paper presented at the National Association for Gifted Children, Indiana.

Schmit, A. M., & Son, Y. E. (2014, February). *The perceptions of preservice teachers toward giftedness and gifted education.* Poster presentation at the Higher Education Pedagogy, Blacksburg.

Son, Y. E., & Costis, P. (2014, March). "Real-World" Assessment. Paper presented at the National Curriculum Network Conference, Williamsburg.