Views of Graduate Students in Gifted Education on Hilda Taba Strategies

Özel Yetenekliler Eğitimi Alanındaki Lisansüstü Öğrencilerin Hilda Taba Stratejilerine Yönelik Görüşleri

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Özet

Türkiye'de yükseköğretim özel yeteneklilerin eğitimi alanında uzman yetiştirmede önemli bir yere sahiptir. Bu çalışmada özel yeteneklilerin eğitimi tezli yüksek lisans programında yer alan Analitik Düşünce Modelleri dersi kapsamında ele alınan Hilda Taba stratejilerine yönelik öğrenci görüşlerinin belirlenmesi amaçlanmıştır. 2021-2022 eğitim öğretim yılı bahar döneminde gerçekleştirilen bu dersi 6 yüksek lisans öğrencisi almış ve çalışmaya tüm öğrenciler dâhil olmuştur. Katılımcılar alanda çalışacak öğretmen ve uzman adayları oldukları için stratejilere yönelik görüşleri önemlidir. Derste kavram gelişimi, veri yorumu, genellemelerin uygulanması ve çatışma çözümü olmak üzere dört Hilda Taba stratejisine yer verilmiştir. Yüksek lisans öğrencileri bu stratejileri birden fazla uygulama yaparak öğrenmişler ayrıca özgün strateji planları hazırlamışlardır. Ders sonunda öğrenciler, görüş formundaki açık uçlu sorulara cevap vererek stratejilerle ilgili görüşlerini paylaşmışlardır. Araştırma betimsel araştırma yöntemiyle gerçekleştirilmiş, verilerin analizinde ise içerik analizi kullanılmıştır. Veriler üç araştırmacı tarafından bağımsız okunarak kodlanmış ve sorular kapsamındaki temalara yerleştirilmiştir. Araştırma sonuçlarına göre katılımcılar Hilda Taba stratejilerine yönelik olumlu görüşler sunmuşlardır. Stratejilerin kalabalık sınıf mevcudundan kaynaklı bazı uygulama güçlükleri olabileceğini ancak analitik düşünmeyi geliştirdiğini, olumlu öğrenme ortamı oluşturduğunu ve özel yetenekli öğrencilerin gelişimine katkı sunduğunu belirtmişlerdir.

Anahtar Sözcükler: Analitik Düşünme, Hilda Taba Stratejileri, Özel Yetenekliler Eğitimi, Yükseköğretim

Abstract

Higher education in Türkiye has an important place in training specialists in the field of gifted education. This study aimed at revealing the student views on Hilda Taba strategies that emerged during the discussions held as part of the Analytical Thinking Models course in a gifted education Master's program. All of the six participants taking this course in the spring semester of the 2021-2022 academic year were included in the study. Since the participants are candidates teachers and experts who will work in the field, their views on strategies are important. The course covers four Hilda Taba strategies: concept development, data interpretation, application of generalizations, and conflict resolution. The graduate students learned these strategies in more than one practical way and prepared original strategy plans. At the end of the course, the participants shared their opinions about the strategies by answering the open-ended questions in the opinion form. The study was carried out with the descriptive research method, and content analysis was used for the data analysis. The data were read and coded independently by three researchers and placed in the themes created in line with the research questions. According to the results of the research, the participants presented very positive opinions about Hilda Taba strategies. They stated that the strategies may have some implementation difficulties due to the large class size, but that they improve analytical thinking, create a positive learning environment and contribute to the development of gifted students.

Keywords: Analytical Thinking, Hilda Taba Strategies, Gifted Education, Higher Education

The fact that gifted students have different needs compared to students with typical development requires differentiation in educational practices. For this, education can be provided in homogeneous or heterogeneous environments (Satmaz & Gencel, 2016). Various strategies such as acceleration, enrichment and grouping can be used. However, regardless of the chosen type, differentiation seems to be necessary to meet their educational needs. The main individuals responsible for providing this differentiation to students are teachers who work with gifted students. In the literature, it has been suggested that teachers have the most important impact on the learning and development of gifted students (Clark, 2002; Lassig, 2003). When teachers who will create this effect have deficiencies in differentiation, the development of students may be supported in a limited way. Satmaz and Gencel (2016) stated that teachers working with gifted students need training in different teaching techniques. Therefore, use of these techniques are also extremely important for postgraduate students, who are teacher candidates.

It is critical that teachers who are to work in learning environments such as special education classes with gifted learners, support rooms, and separate classrooms of private schools are provided with undergraduate and graduate education opportunities and in-service training to improve their professional competence.

Offering support to teachers who will work with gifted students is crucial, both through pre-service and in-service teacher training programs. These trainings can include various dimensions such as the characteristics of the gifted, their identification, instructional differentiation, preparation of appropriate content and environment, and evaluation. Acquiring teaching strategies, methods, and techniques that are suitable for these special students is a key subject and skill area in the education of gifted students and the creation of appropriate learning content and environments. Strategies, methods, and techniques that can be effective in the education of gifted students mostly involve options that can foster high-level thinking skills in these students (Maker & Schiever, 2005; Sak, 2012; Schiever, 1991; VanTassel-Baska et al., 2000).

Examining the views of teachers who work or will work with gifted children on the use of higher order thinking skills in the classroom may provide information on the effective use of such thinking skills in differentiating classrooms. They can offer researchers information about their current competencies, their viewpoints on differentiation, areas that require support, and how to implement strategies, methods, and techniques to enhance these skills.

Analytical Thinking

One of the important higher order thinking skills is analytical thinking defined as the ability to disassemble a whole, examine the relationships between parts and the whole, and rationalize it (Pennycook et al., 2015). It is one of the 21st century skills that can take individuals one step ahead of others, and is viewed as essential in solving problems encountered in complex life situations (Chaijaroen et al., 2012). As such, analytical thinkers are highly in-demand and are favored by the society since they are perceived as well-qualified individuals (Bilen, 2002).

Analytical thinking can be defined by highlighting its particular aspects depending on the discipline in which it is used. For example, Uysal (2004) suggests that mathematics forms the foundation of analytical thinking. Chuah (2009) states that analytical thinking is an indispensable skill in engineering education. According to Kocabaş (2021), the acquisition of analytical thinking skills should be considered as part of mathematics and science.

Although analytical thinking is studied by experts from various fields, there are some common aspects in its definitions, which can be listed as breaking the whole into parts (Arıol, 2009; Gürkaynak, et al., 2003; Hammouri, 2003; Krathwohl & Anderson, 2010; Sternberg, 2003), establishing relationships (Bloom, et al., 1956; Facione, 2011; Gürkaynak et al., 2003; Sexton, 2013; Sternberg, 2003), organizing (Krathwohl & Anderson, 2010; Marzano, 2001; Montaku et al., 2012), and finding solutions using previous knowledge (Amer, 2006; Chonkaew et al., 2016; Robbins, 2011). People dissect an idea or situation into parts with analytical thinking, make choices, and use the information they obtain in solving problems and achieving a desired result (Montaku et al., 2012). Analytical thinking is an indispensable skill used in mind mapping, elimination of ideas, and decision-making.

Considering the common characteristics listed above, Sternberg's (2003) definition can be said to cover analytical thinking comprehensively, which is actually one of the three types of intelligence: creative, practical, and analytical. Analytical thinking includes elements such as analyzing, making comparisons, identifying similarities and contrasts, matching and comparing. According to Amer (2006), analytical thinking is a skill that includes decision-making processes and forms the basis of most higher-order thinking skills. This skill is related to coordinating, decision making, critical thinking, problem solving, scientific thinking, creative thinking and even aesthetic thinking. Higher order thinking skills, including analytical thinking, are thinking skills that emerged from Bloom's taxonomy (Brown, 2004). The types of analysis, evaluation and creation, which are called higher-order thinking skills and included in Bloom's taxonomy, are interrelated (Crockett, 2022).

Reviewing the literature on analytical thinking in education, we find that Kanyılmaz and Özata Yücel (2020) investigated primary school teachers' thoughts about analytical thinking in science lessons and whether they included it in their classroom practices. According to the findings obtained from the interviews with the 3rd grade teacher and the 4th grade teacher, the teachers stated that student-centred approaches in science lessons were important in developing analytical thinking. However, as a result of the observations of classroom practices, it was observed that the 3rd grade teacher partially reflected this student-centred approach in science lessons, while the 4th grade teacher reflected it more. In line with the findings, the researchers suggested that teachers should receive trainings to improve their ability to use analytical thinking better in the classroom during the teacher training process or in-service trainings. In another study, Çelik et al. (2015) focused on the opinions of science teachers on the identification and development of their students' analytical thinking skills. Science teachers expressed strong analyzing skills, visual/spatial intelligence, being able to establish part-whole relationship, having problem solving skills, being a researcher, being able to express their ideas freely, being courageous, being curious, being practical minded, producing new/unique ideas, being inquisitive as the characteristics of analytical thinking

individuals. The most frequently mentioned methods and techniques used by teachers to develop analytical thinking skills are: brainstorming, problem solving, experiment, invention, question and answer, concept maps.

Akkuş Çakır and Senemoğlu (2016) examined pre-service teachers' analytical thinking skill levels and the factors affecting the development of these skills. According to their findings, although the analytical thinking levels of the fourth-year students of the university were higher than the first-year students, it was stated that the analytical thinking skills of the students at both grade levels were at a low level. Yulina et al. (2019) analyzed pre-service teachers' analytical thinking profiles in learning analytical chemistry and they found that preservice chemistry teachers' analytical thinking skills level were low, especially in specifying, analyzing error and generalizing skills.

Sebetci and Aksu (2014) examined the effect of logical and analytical thinking skills on the success of programming languages in an undergraduate computer and programming department. Results showed that analytical thinking skills of the students and their course achievement were positively and moderately related. Kocaman (2021) developed a program as called Analytical Thinking Based Online STEM Curriculum. This programme was implemented with gifted students attending the Science and Art Center, and a significant difference was found between the pre-test and post-test scores of the students from the analytical thinking skills scale in favour of the post-test. Unnanantn and Boonphadung (2015) examined pre-service teachers' attitudes towards the analytical thinking skills teaching via Miller's Model in the English course. Twelve of the pre-service teachers stated that the use of methods to develop analytical thinking in language teaching was new information for them, 11 of them stated that these methods were applicable in language learning, and 6 of them expressed a positive impression regarding these methods.

Among the examined studies above, there are a limited number of studies on teaching techniques to develop analytical thinking. However, to raise individuals who can respond to the needs of the modern age, education systems need to prioritise analytical thinking skills (Kutlu et al., 2010). It is especially important to support the analytical thinking skills of gifted students in order for them to realize their own potential and be happy, and then to support social progress. One way to learn and develop these skills effectively is to utilize specific strategies, methods or techniques of analytical thinking skills in classrooms. Therefore, studies on these specific strategies, methods or techniques are important in terms of contribution to the literature and development of analytical thinking skills of the gifted students. One of the strategies that can be used to develop not only gifted students but also all learners' analytical thinking skills is Hilda Taba strategies.

Hilda Taba Strategies

Taba (1966) thinks that in addition to age and maturity, continuity and experience are also important in cognitive development. She does not attribute the development of thinking and thoughts only to the acquisition of certain knowledge but thinks that cognitive development occurs in a continuous flow or a series of transformations. It is also possible to trigger and improve cognitive development with experiences, like those learners have at school. Taba believes that learning by discovery initiates an interaction between the content and the learning process. This interaction occurs as the learner establishes a relationship between existing schemas and new learning, and reformulates their schemas to accommodate newly formed information. Therefore, the process of acquiring knowledge is seen as the development of structures that are tested or modified to facilitate learning and thinking (Glaser, 1984).

Taba strategies, developed based on the perspectives of Piaget, Bruner, Vygotsky and the philosophy described above, are among the strategy sets that can develop analytical thinking. This set consists of four inquiry strategies that can be used at all grade levels and in all content areas. These are *concept development*, *data interpretation*, *applying generalizations*, *and conflict resolution* (Schiever, 1991).

Hilda Taba Strategies can be described as highly structured teaching methods that guide students through a series of intellectual tasks by asking open-ended but well-defined focus questions. Three of the four strategies (concept development, data interpretation, applying generalizations) are more influential in the cognitive domain, and the last one (conflict resolution) has stronger effect in the affective domain. Cognitive strategies include affective elements and the last strategy has a strong cognitive dimension (Trezise, 1972). Designing certain question series to achieve the goals is a common feature of all four of them (Taba et al., 1971). Descriptions of each are given below.

Concept Development: This strategy allows students to form, clarify, and expand concepts. While applying the strategy, students list items related to a concept or experience, and then classify them according to some similarity or common relationship between them. They find names for the groups obtained by these classifications and label the groups. They collect the listed items under other labels they produce. They can also place labels or tags under more inclusive ones. Therefore, a cognitive process in which data is constantly rearranged is activated.

Data Interpretation: With this strategy, students make inferences about the short- and long-term cause-effect relationships of a situation or event. Students can focus on causes or effects according to the purpose of the activity. They also need to draw conclusions in the process, support their conclusions, and be able to generalize about relationships.

Applying Generalizations: This strategy seems a bit complicated at first glance. Essentially, the strategy helps students make predictions about a hypothetical situation based on their own knowledge, which can be short-term or long-term. Students limit their predictions by identifying necessary and auxiliary conditions, and establish a causal link between these conditions and predictions. They need also to be able to support their predictions and inferences, draw conclusions and provide evidence for them. Finally, they need to be able to regulate and support the generalizations presented as part of the strategy.

Conflict Resolution: This strategy is related more to the affective domain, and helps students see the complexity of interactions in conflict situations. While implementing the strategy, students generate various possible solutions to conflicts and discuss their effects on the people involved in the conflict. They interpret the attitudes, values, and feelings of individuals involved in the situation. Afterwards, students voluntarily share a similar situation in their own life or in the life of a relative. Depending on the shared situation, the steps taken at the beginning are taken again. Ultimately, students are asked to reach generalizations about human behavior in such conflicts. Therefore, not only the affective skills but also analytical thinking skills are supported with this strategy.

Taba drew attention to several points for the development of analytical thinking and the meaningfulness of the data produced in related strategies, one of which is to enable students to focus on data individually, and another is accurate content selection, as the richness of the content affects the quality of students' thoughts (Taba, 1966). In addition, teachers should be well prepared and meticulously present the focus questions to the students during the application of the strategies (Schiever, 1991). Hall and Myers (1977) organized a year-long in-service training program that included Hilda Taba strategies for 37 teachers. Their findings show that this experience creates changes in teachers' classroom methods and perceptions of their performance and teacher performance increases steadily throughout the year as indicated by Hilda Taba program standards.

In another study, Hanninen (1989) examined the effects of Hilda Taba teaching strategies on the critical thinking and creative thinking skills of primary and secondary school students and found that the fluency and flexibility scores of the groups taught by using Hilda Taba teaching strategies increased. However, the strategies had a limited effect on critical thinking behaviors.

Reviewing the related literature, the studies on Hilda Taba strategies are very limited and the current studies are very few. Hilda Taba teaching strategies are teaching methods that aim to develop higher thinking skills in students, especially gifted ones. They involve asking open-ended questions, encouraging divergent thinking, facilitating group discussions, and using various cognitive strategies such as

analysis, synthesis, and evaluation (Loury, 2004). Hilda Taba teaching strategies were important for gifted education because they help gifted students to challenge themselves, to solve problems creatively, to explore different perspectives and to develop moral reasoning. The use of these strategies, especially by teachers who are to work with gifted students, may help support students' analytical thinking skills. Hilda Taba teaching strategies also meet the needs of gifted students for differentiation, enrichment, and intellectual stimulation. It is critical for people who are to work with gifted learners to differentiate their courses, and these strategies can be an important resource for differentiation (Tomlinson & Jarvis, 2009). Teachers' use of such strategies is closely related to their ability to master them and to find them practical and useful. Therefore, it is important to identify teachers' perspectives on these strategies. In addition, revealing their views will help determine whether their competence in strategy use needs to be supported. The share of higher education in the studies to be conducted on the subject is very valuable. In Türkiye, where reliable learning resources and in-service trainings in this field are limited, the role of higher education institutions in the field becomes more critical.

The purpose of this study was to examine the views of graduate students who learned Hilda Taba strategies about the use of these strategies while teaching in classrooms with gifted children. In line with this general purpose, the participants' views on the use of the strategies were determined in terms of the contributions of the strategies to gifted students, the advantages of the strategies, and the challenges related to the use of the strategies. The findings will provide insights on whether Hilda Taba strategies can be used actively and effectively by teachers who work with gifted students.

Method

In this section, information about the research design, participants, data collection tool, data collection procedures, and data analysis are presented.

Research design

Descriptive studies aim to reveal the opinions, attitudes or behaviors of individuals regarding the subject under study (Creswell, 2008). With this research design, individuals' thoughts on a subject can be described directly by defining them in a simple way (Sandelowski, 2010). The current study is a descriptive study in that it reflects the experiences of participants who attended a course on Analytical Thinking Models including Hilda Taba strategies.

Participants

The participants were studying a gifted education master program in a university in Türkiye. They were selected for participation by using the criterion sampling method

(Creswell, 2008; Patton, 2015; Yıldırım & Şimşek, 2018), one of the purposive sampling methods. Purposive sampling aims to identify participants who can enlighten the researchers about the research questions and who have extensive knowledge about the subject studied (Patton, 2015). The selection criteria for the sampling were attending the course called *Analytical Thinking Models*. In fact, in the 2021-2022 spring semester there were only 6 master students in gifted education master program and all of them joined this course. All of them attended the course and fully participated in the activities. Therefore, in this study, all students in the period of data collection could be included in the research. The information about the participants is given in ▉▉ Table 1.

▉▉ Table 1. Information About the Participants.

Participant	Gender	Undergraduate program	Profession
Participant 1	Female	English Language Teaching	English teacher
Participant 2	Female	Special Education Teaching	Research assistant
Participant 3	Female	Guidance and Psychological Counseling	School counselor
Participant 4	Male	Guidance and Psychological Counseling	Research assistant
Participant 5	Female	English Language Teaching	English teacher
Participant 6	Female	Guidance and Psychological Counseling	School counselor

As shown in ▉▉ Table 1, one of the participants is male and the others are female. There is diversity in their undergraduate programs and professions. The study participants were limited to 6 people. Because at the time of data collection, the total number of active students enrolled in this master's program in gifted education was already 6. Although this course was a selective course, all of the students chose this course and participated in the study. All participants voluntarily participated in the study.

Data Collection Tools

The data were obtained by using an opinion form consisting of open-ended questions. The data collection tool in the study was developed by the first author. Expert opinion regarding the scope, language, and intelligibility of the first version of the developed opinion form was also obtained. The draft opinion form was evaluated by two lecturers working in the Department of Education for the Gifted and two qualitative research experts, and the form was finalized by making the necessary revisions accordingly. The opinion form consists of four parts: the concept development strategy of Hilda Taba strategies, the strategy of data interpretation, the strategy of applying generalizations, and the strategy of conflict resolution. There were 12 questions in total, with three questions in each of these four parts of

the form. The questions about contributions of strategies to gifted students, advantages of strategies for teachers and disadvantages of strategies for teachers.

Data Collection Procedures

The data collection was gathered by the first author. All of the 6 participants were enrolled in the distance-based *Analytical Thinking Models* course in the 2021-2022 spring semester. The course content includes theoretical information presentation about the Taba strategies and includes working on practical activity development about these strategies. For instance, the course lecturer (the first author) first discussed each strategy theoretically, and also carried out at least one sample application by involving the students as participants. Then, the students started to practice. All participants actively participated in each of these practices. The participants formed groups of three for group work. The group members changed their groups during the implementation of each strategy, and thus, two group works could be conducted for each strategy. In addition, students created an individual application and an individual report.

After the teaching of all the strategies and their related applications during the semester, a form consisting of open-ended questions was sent to the students in the last week of the course held over the distance education system, and the students filled the forms and uploaded them to the system. The first author examined the answers of the students, the statements that could not be understood were identified, and two participants were contacted again to clarify and confirm their responses. The participants, who were contacted by phone call, were asked to explain the parts that were not understood. The participants sent their explanations to the researchers via e-mail for the parts that were not clear.

Data Analysis

The data were analyzed through a content analysis method (Miles et al., 2014). Qualitative data analysis involves working with data, organizing them, dividing them into manageable units, coding, synthesizing, and looking for patterns (Bogdan & Biklen, 2007). In the analysis process of this study, the procedures recommended by Miles et al. (2014) were followed. In this context, data were coded, themes were created, similarities and differences between them were studied, overarching themes were obtained and tabulated. While analyzing data, the researchers worked independently and then came together to reach a consensus and reworked the points they could not reach. Data analysis was carried out by three researchers. Each of the researchers is an expert in the field of gifted education with a PhD degree. In these processes, the data gathered from the opinion form were analyzed by three researchers, coded and frequency-percentage values were determined.

In qualitative research, it is extremely important to make sure that findings and interpretations are carried out correctly during the data collection and analysis process. These processes can be ensured to be accurate through member checking and external auditing (Patton, 2015). In the member checking process in this study, the researchers received confirmation from the participants for the accuracy of the inferences they obtained. In addition, an external review of the study was conducted by another non-author researcher. This person reviewed the strengths and weaknesses of the study and gave opinions to the authors. In the process, ethical permission was obtained from the institution where the study was conducted. In addition, the participants were informed that they could withdraw from the study at any time. The real names of the participants were not used in the study. The identity information of the participants was kept confidential and codes were given to each of them. In the analyzing process, researchers read the data separately, determined the codes and themes, and then analyzed the results together. They clarified the agreed codes and themes and negotiated the ones that were not agreed upon. The findings were supported with direct quotations in order to reflect the views of the participants clearly and completely in the reporting. The data of the research were filed in a computerized environment and made auditable. In the article, the findings were tabulated in a way that the reader can understand.

Table 2. Results on concept development strategy.

Category Contributions to gifted students	Frequency	Subcategory	Frequency
Analytical thinking	12 (5 participants)	Classification skill	7
		Planning skill	3
		Building relationships	2
Creativity	9 (4 participants)	Development of creativity	6
		Generating new product/ idea	3
Concept teaching	1 (1 participant)	Concept teaching	1
Cognitive development	3 (2 participants)	Cognitive level development	3
Inductive perspective	1 (1 participant)	Holistic perspective	1

Category Advantages of strategies	Frequency	Subcategory	Frequency
Positive classroom atmosphere	7 (3 participants)	Sustaining student participation	3
		Sustaining student interest	2
		Positive classroom atmosphere	1
		Managing the classroom	1
Organizing the teaching process	5 (4 participants)	Use of techniques	1
		Moving away from traditional teaching	3
		Enabling planning	1
Getting to know the student	4 (2 participants)	Provides the opportunity to get to know the student	2
		Provides the opportunity to evaluate the student	1
		Learning the current knowledge level of the student	1
Learning retention	3 (2 participants)	Achievement of learning	3

Category Difficulties of strategies	Frequency	Subcategory	Frequency
Classroom management	6 (4 participants)	Classroom management difficulty	3
		Barriers to some students' participation	2
		Inability to ensure active participation	1
Difficulty with application	6 (5 participants)	Difficulty with application	1
		Time problem due to class size	1
		Difficulty in implementation due to class size	1
		Implementation difficulty for the student	1
		Student boredom	1
		Difficulty due to student's personality traits	1

Compliance with Ethical Standards

This study was approved by the Ethical Committee of Anadolu University Social and Human Sciences Scientific Research and Publication Ethics Committee with the protocol number 300481 dated 22.04.2022.

Results

The results regarding the participant views on Hilda Taba Strategies are tabulated on the basis of each strategy.

Results on Concept Development Strategy

The results regarding the concept development strategy are shown in ▐▐ Table 2.

Our analysis of the participants' views on the contribution of the concept development strategy to gifted students revealed five main categories. The analytical thinking category was the most frequently recurring category expressed by five graduate students. The second important category, based on the recurrence frequency of the categories, is the category of creativity. The opinions of four out of six graduate students who participated in the research fell under this category. The subcategory of classification skill has highest frequency. The second most frequent subcategory is the development of creativity. The least-frequently-expressed categories were concept teaching and inductive perspective, each stated by one participant. Some of the views on how the concept development strategy will contribute to gifted students are as follows:

"It will help gifted students to group and organize concepts. Brainstorming will contribute to the creative thinking skills of gifted students. With this strategy, abstract, as well as concrete concepts can be taught." (P1)

"… Therefore, teaching a concept through other concepts supports and develops creativity…Creativity will be triggered… It contributes to cognitive growth by enabling gifted individuals to establish relationships between concepts, and to group and think about their contrasts." (P3)

As can be seen in the participant statements above, the development of analytical thinking and creativity skills is the prominent contribution of the concept development strategy for gifted students.

According to ▐▐ Table 2, the findings regarding the advantages of the concept development strategy for practitioners/teachers are grouped into four categories. Among these categories, organizing the teaching process was the category expressed the most often (four participants). The second important category according to the frequency of the categories is the positive classroom atmosphere category. The opinions of three

graduate students who participated in the study were in this category. Some participant views on what kind of advantages the concept development strategy will provide to practitioners/teachers are as follows:

"….Allows students to practice teaching through less traditional methods." (P4)

"…as a summary of the subject studied, it is a process that activates the student…the teacher can determine the subjects to be studied in the future." (P6)

As can be seen in ▐▐ Table 2, the results regarding what kind of challenges the concept development strategy have for practitioners/teachers are gathered into two categories. Opinions in both categories were expressed in equal frequency. While five participants mentioned the difficulty of implementation, four participants pointed at classroom management. The difficulty of classroom management and the obstacles in ensuring the participation of some students, respectively, were the subcategories with the highest recurrence. Other subcategories were the least frequently expressed categories. Some of the participants' views on what kind of difficulties the concept development strategy will cause for practitioners/teachers are as follows:

"It will be difficult to manage crowded classrooms if students speak all at the same time and not listen to each other." (P1)

"…the teacher may find it difficult to involve students who are shy, introverted, and resistant to participation in the lesson." (P3)

Results on Data Interpretation Strategy

The results regarding the data interpretation strategy are presented in ▐▐ Table 3.

Among the six main categories seen in ▐▐ Table 3, the analytical thinking category was the category with the highest frequency expressed by five graduate students. The second most important category based on frequency is the cause-effect relationship category. The opinions of four out of six graduate students who participated in the study fell under this category. Considering the recurrence of subcategories, the highest frequency belongs to the subcategory of establishing a cause-effect relationship. The second most- frequently-repeated subcategory is the making a logical relationship subcategory. The least frequent categories were inductive thinking and cognitive development.

Some participant views on how the data interpretation strategy will contribute to gifted students are as follows:

"It helps them comprehend cause-effect relationships and thus to think creatively." (P1)

Table 3. The results on data interpretation strategy.

Category Contributions to gifted students	Frequency	Subcategory	Frequency
Analytical thinking	11 (5 participants)	Making a logical relationship	3
		Logical thinking development	2
		Development of generalization skills	2
		Relationship interpretation	1
		Making inferences	1
		Multidimensional analysis	1
		Discovering relationships	1
Cause-effect relationship	5 (4 participants)	Ability to establish cause-effect relationships	5
Creativity	3 (2 participants)	Development of creative thinking	1
		Supporting flexible thinking skills	1
		Supporting fluency	1
Inductive thinking	1 (1 participant)	Inductive reasoning ability	1
Cognitive development	1 (2 participants)	Cognitive ability development	1
		Active use of cognitive processes	1
Positive classroom atmosphere	2 (2 participants)	Enjoyment	2

Category Advantages of strategies	Frequency	Subcategory	Frequency
Use of strategy	6 (3 participants)	Ease of application	3
		Applicability in crowded classrooms	1
		Saving time	1
		Being functional	1
Nurturing relation-ship-building skills	4 (4 participants)	Helping them find complex relationships	1
		Supporting relationship building	1
		Helping them find cause-effect relationships	2
Professional skills	3 (1 participant)	Leadership	1
		Guidance	1
		Classroom management	1
Positive classroom atmosphere	1 (2 participants)	Enjoyment	1
		Sustaining interest	1
		Ensuring student participation	1

Category Difficulties of strategies	Frequency	Subcategory	Frequency
Strategy-related difficulties	5 (3 participants)	Having repetitive stages	1
		Implementation difficulties due to class size	2
		Following the discussion	1
		Discussion requires attention	1
Difficulty for disadvantaged groups	2 (1 participant)	Difficulty with twice-exceptional students	1
		Difficulty in students with attention deficit and special learning difficulties	1
Readiness	2 (1 participant)	Readiness	2
No difficulty	1 (1 participant)	No difficulty	1

"…It can provide an enjoyable discussion environment… establishing in-depth cause-effect relationships is also important especially for enrichment activities." (P4)

As shown in ▮ Table 3, the results regarding the advantages of the data interpretation strategy for practitioners/teachers fell under four categories. Among them, the use of strategy category is the one with the highest frequency. The second most important category by frequency is the category of nurturing relationships, which was pointed out by four graduate students participating in the study. Based on recurrence, the ease of application and finding cause-effect relationships subcategories have the highest frequency. The category that was the least frequently mentioned by the participants was the positive classroom atmosphere category.

Some participant views on what kind of advantages the data interpretation strategy will provide to practitioners/teachers are as follows:

"It is an easier strategy to use compared to other strategies. Teachers can practice in crowded classrooms without any fuss." (P1)

"… (The teacher) can work with students by having a pleasant time. The fact that it has much easier implementation steps compared to other strategies and that many effects/reasons can be elicited from one focus question makes data interpretation a strategy of choice for teachers." (P6)

As can be seen in ▮ Table 3, the results regarding what kind of difficulties the data interpretation strategy pose for practitioners/teachers are gathered into four categories. The category with the highest frequency is the category of strategy-related difficulties, whereas having no difficulty was reported by only one participant. Based on the frequency of recurrence of the subcategories, the highest frequency belongs to the application difficulty and readiness subcategories due to the class size. Other subcategories were the least-frequently expressed categories.

Here are some participant views on what kind of challenges the data interpretation development strategy poses for practitioners/teachers:

"It is a strategy that I do not think will create any challenges on the part of the practitioner as long as the focus questions are clear and understandable." (P1)

"…This strategy may not be functional for the distracted or twice-exceptional gifted children who have difficulty in establishing a cause-effect relationship and connection. It is known that students with attention deficit and special learning difficulties have difficulties in establishing cause-effect relationships, have difficulties in establishing a before-after connection, and have short attention spans. As such, it may be hard to implement this strategy in a classroom with gifted individuals with these characteristics." (P3)

Results on the Applying Generalizations Strategy

The results of the strategy of applying generalizations are presented in ▮ Table 4.

As can be seen in ▮ Table 4, the results regarding how the strategy of applying generalizations contributes to gifted students were gathered in six categories: making predictions, logic-reasoning skills, generalization, critical thinking, other thinking skills, and learning. While the critical thinking category is the most-frequently-cited category, it is followed by the categories of predicting, logic-reasoning, other thinking skills, and generalization. One participant expressed an opinion regarding the category of learning.

Two of the direct quotations from the participants' views on the contribution of the strategy of applying generalizations to gifted students are as follows:

"Their ability to make predictions about the future develops. They learn to explain the unknown, make predictions and base their opinions on logical foundations. (P2)

"It develops their critical thinking skills. It allows looking from different angles..." (P5)

The participants also expressed their views on the advantages of the strategy of applying generalizations for the practitioners, and these opinions were gathered in five main categories and shown in ▮ Table 4. As seen in ▮ Table 4, providing a positive classroom atmosphere is the most common contribution according to the participants. This was followed by the categories of instructional contribution and self-improvement, while the categories of imagination and assessment were each stated by one participant. Some examples of direct quotations from the participants can be listed as follows:

"It is an application that will develop the imagination of both teachers and students. Teachers can use this strategy instead of teaching the subject again." (P2)

"The interests of the students are sustained and the motivation to participate in the lesson becomes stronger. Sharing information makes the lesson fun for both teacher and students" (P5)

The difficulties involved in using the strategy of applying generalizations for practitioners are gathered in five main categories, which are shown in ▮ Table 4. As seen in ▮ Table 4, the most common difficulties are those experienced due to the overcrowded classrooms. Although the themes of application difficulties and teacher competency are similar, they were put into two separate categories, as one is related to the teacher and the other is related to the strategy. The views of the participants can be exemplified with the following direct quotations:

Table 4. Results on the applying generalizations strategy.

Category Contributions to gifted students	Frequency	Subcategory	Frequency
Critical thinking	7 (6 participants)	Developing critical thinking skills	6
		Developing inquiry skills	1
Making predictions	6 (6 participants)	Development of hypothetical thinking skills	1
		Developing the ability to make assumptions	5
Logic-reasoning	5 (4 participants)	Using logical thinking skill	3
		Teaching how to offer rational support for their views	1
		Ability to make inferences	1
Other Thinking Skills	5 (4 participants)	Developing selective thinking	1
		Ensuring the development of metacognitive thinking	1
		Developing assessment skills	1
		Developing creative thinking skills	1
		Allows you to view from different perspectives	1
Generalization	3 (2 participants)	Developing the ability to transfer to another situation	1
		Developing generalization skills	2
Learning	1 (1 participant)	Concept learning	1

Category Advantages of strategies	Frequency	Subcategory	Frequency
Positive classroom atmosphere	8 (4 participants)	Ensures active participation	3
		Enjoyable application	2
		Fluent application	1
		Motivating	1
		Drawing attention	1
Instructional contribution	2 (2 participants)	Facilitating the teaching of abstract concepts	1
		Alternative practice to redo	1
Self-improvement	2 (2 participants)	Motivating	1
		Self-confidence supportive	1
Imagination	1 (1 participant)	Developing the imagination	1
Assessment	1 (1 participant)	Opportunity to assess the student's level of understanding	1

Category Difficulties of strategies	Frequency	Subcategory	Frequency
Difficulties due to class size	6 (3 participants)	Difficulty in implementation due to large class size	3
		Difficulty including all students	1
		Difficulty organizing discussion	1
		Time management difficulties due to over crowdedness	1
Student characteristics	3 (1 participant)	Stereotypes	1
		The problem of intolerance	1
		Prejudice-related difficulties	1
Instructional difficulty	2 (1 participant)	Instructional difficulties	1
		Causing misconceptions	1
Difficulty with application	1 (1 participant)	Having difficulty organizing	1
Teacher competency	1 (1 participant)	Difficulty making generalizations	1

"The most important difficulty that can be encountered in generalization is prejudices or students' resistance to going beyond generalizations. Problems may be encountered in the active participation of a student who has a stereotypical mindset or in behaving respectfully and tolerantly to the opinion of another classmate. Therefore, teacher's ability to manage the process is critical." (P3)

"…The large size of the application group raises challenges in issues such as reaching all group members, organizing the discussions, and time management." (P4)

Results on Conflict Resolution Strategy

The results obtained regarding the contribution of the conflict resolution strategy to the gifted students are presented in ▉ Table 5.

Contributions of the conflict resolution strategy to gifted students are shown in two main categories in ▉ Table 5. Each participant stated the contribution of this strategy to social-emotional development, and one participant stated its contribution to a positive classroom atmosphere. A few

direct quotes from the views of the participants can be listed as follows:

"…will help attract the attention of gifted students and help them focus on the lesson. The most important contribution of this strategy is to develop the ability to empathize." (P1)

"Gifted individuals are known to have problems sometimes in socializing due to their needs that differ from their peers. Especially by using the conflict resolution strategy, the challenging situations faced by gifted students in social environments can be studied."(P4)

As seen in ▉ Table 5, the opinions about the advantages of the conflict resolution strategy for the practitioners are gathered in five main categories, which are teaching affective skills, ease of application, thinking skill acquition, getting to know the student, and positive classroom climate. The participants most frequently mentioned contributions under the category of teaching affective skills. One opinion is given for other categories. Some of the direct participant opinions can be presented as follows:

▉ **Table 5.** Results on conflict resolution strategy.

Category Contributions to gifted students	Frequency	Subcategory	Frequency
Social-emotional development	6 (6 participants)	Developing empathy skills	2
		Raising personal awareness	2
		Self-assessment opportunity	1
		Being effective in solving challenging social problems	1
Positive classroom atmosphere	1 (1 participant)	Getting the student's attention	1
Category Advantages of strategies	**Frequency**	**Subcategory**	**Frequency**
Teaching affective skills	8 (5 participants)	Empathy teaching	1
		Teaching different solution approaches	1
		Support in making students responsible	1
		Supporting students in coping with their problems	1
		Teaching problem-coping skills	1
Ease of application	1 (1 participant)	Ease of application	1
Thinking skill acquisition	1 (1 participant)	Developing critical thinking skills	1
Getting to know the student	1 (1 participant)	Provide the opportunity to get to know the student	1
Positive classroom atmosphere	1 (1 participant)	Getting students' attention	1
Category Difficulties of strategies	**Frequency**	**Subcategory**	**Frequency**
Difficulties in implementation	5 (3 participants)	Implementation difficulty	3
		Requires preparation	1
		Disruption of gradual flow	1
Professional competence	1 (1 participant)	Level of proficiency in conflict management skills	1
Implementation difficulties due to class size	1 (1 participant)	Difficulty in applying in case of large class size	1
Student characteristics	1 (1 participant)	Causing cognitive inhibition	1

"… Teachers get to know students better. They learn about the traumas that the student has gone through and maybe they can help their students to cope with these problems."(P2)

"Since the memorability is high in the later stages of the strategy, which starts with watching a video or reading from text, there is no need to be reminded very often if the focus questions are asked correctly. As such, it offers teachers a flowing process and an easy application."(P6)

As seen in ▪▪ Table 5, the participants mostly drew attention to difficulties implementations, while they highlight the categories of professional competence, implementation difficulties due to class size and student characteristics less frequently. Some examples of the participant opinions are given below:

"I think conflict resolution is the most complex strategy… If the teacher does not prepare focus questions, the topic can quickly get off track and the discussion may lose sight of its purpose."(P2)

"Since the conflict resolution strategy offers relational and experiential data, students may not respond to a situation that comes to mind and give answers in the intended way. This will cause problems at the termination of the process."(P6)

Discussion, Conclusion, and Suggestions

In this study, the views of the teachers who were attending a master's program in gifted education and taking an *Analytical Thinking Models* course on Hilda Taba strategies were examined. The study was carried out after these strategies were taught. Teacher views on the contributions of Hilda Taba strategies (concept development, data interpretation, applying generalizations, and conflict resolution) to students, their advantages and difficulties for teachers/practitioners.

The participants emphasized the development of cognitive skills in the strategies of concept development, data interpretation, and applying generalizations. The way concept development and data interpretation strategies develop analytical thinking was emphasized as well. Regarding the strategy of applying generalizations, their emphasis was on making predictions and logical reasoning, especially critical thinking, which is one of the higher skills that implicitly includes analytical thinking. As for the contributions of the conflict resolution strategy, the development of affective skills, rather than cognitive skills, stands out. One major characteristic that differentiate gifted students from their peers is their extraordinary capacity to acquire knowledge and the ability to effectively use the knowledge they have acquired (Parks, 2009). Gifted children can improve their thinking processes and abilities by using skills such as critical thinking, decision making, and creativity (Burns & Reis, 1991; Parks, 2009). Many experts working in the field of gifted education also agree that teaching thinking skills is crucial and these skills are

included in most of the special talent education programs (Maker & Schiever, 2005; Parks, 2009; Renzulli et al., 2009; Sak, 2011). Although teaching thinking skills has an important place in the education of gifted students, teaching every thinking skill may not be necessary, and analytical and critical thinking skills are stressed as the most critical ones (Burns & Reis, 1991). In this respect, the skills highlighted by the participants regarding the contribution of Hilda Taba strategies to gifted students are also supported by the literature.

In a study conducted with teachers in the literature, teachers stated that various techniques can be used to develop analytical thinking skills (Çelik et al., 2015). Hilda Taba strategies can be used by teachers to develop gifted students' higher-order thinking skills. The most prominent of the skills that Hilda Taba strategies aim to develop is analytical thinking (Schiever, 1991). Our research findings indicate that the participants agree on this issue. The participants think that these strategies are more effective in developing analytical thinking skills. In addition to expressing analytical thinking directly, they also expressed skills related to analytical thinking such as generalizing, establishing relationships, making predictions, hypothetical thinking, logical thinking, classification, making inferences, and inductive thinking. They also emphasized their contribution to the development of skills such as critical thinking and creative thinking. While Hanninen (1989) found significant differences in the pretest-posttest *Torrance Creativity Test-Verbal* scores of the experimental group in which Hilda Taba strategies were applied, no differences in the pretest-posttest scores could be measured by the *Watson-Glaser Critical Thinking Appraisal Test* regarding critical thinking skills. She also found that teachers who applied Hilda Taba strategies positively affected their students' creative thinking behaviors in the areas of fluency and flexibility, but stated that the limited effect of Hilda Taba strategies on critical thinking behaviors may be related to the inappropriateness of the tool used.

Some other studies have examined analytical thinking skills. One of them determined that the analytical thinking-based online STEM curriculum developed the analytical thinking skills (sequencing, classification, comparison and evaluation skills) of gifted students (Kocaman, 2021). However, Akkuş Çakır and Senemoğlu (2016) found that the analytical thinking skills scores of the 1st and 4th grade pre-service teachers were low, and concluded that while these skills developed to some degree thanks to undergraduate teacher education, it was not at the desired level. These findings indicate that the analytical thinking skills of both teachers and students will improve with the teaching and active use of appropriate strategies, methods, and techniques.

Three of the Hilda Taba strategies support cognitive skills, and one of them mostly supports affective skills (Taba, 1966). In this study, the participants pointed out that the

development of affective skills are mostly related to conflict resolution, which is in line with the nature of the strategy. However, the participants may have overlooked that the conflict resolution strategy supports the development of these skills as well as analytical thinking skills. Therefore, further effort is needed to make teachers aware of how analytical thinking skills are used in the application of the conflict resolution strategy.

One approach to increase the effective and frequent use of Hilda Taba strategies by teachers is raising awareness about the advantages of these strategies. Providing a positive classroom/learning atmosphere in concept development, applying generalizations, ease of application in data interpretation, fostering the ability to establish relationships, and gaining affective skills in conflict resolution stand out as the key advantages reported by the practitioners. Many advantages of each strategy are underscored by the teachers. Baysal et al. (2016) found that most of the participating classroom teachers think that instruction on thinking skills helps address the changing necessities of the period. Further et al. (1977) found that teachers' performance improves when they apply Hilda Taba strategies in their classrooms.

Regarding the challenges involved in Hilda Taba strategies for teachers/practitioners, the participants emphasized that the gradual, step-by-step structure of the technique and the difficulties related to the class size created problems during the implementation. Baysal et al. (2016) found that primary school teachers encountered problems in teaching thinking skills, and that these problems may originate from teachers, students, or from the curriculum; some teachers cited limited time among the curriculum-related problems. In the same study, most of the participants found themselves insufficient in their thinking skills (lateral-divergent, metacognitive, reflective, and critical thinking skills). Gürkaynak et al. (2003) emphasize that some basic strategies should be implemented in effective critical thinking teaching, one of which is learning in small groups. The structure of the classroom environment, classroom climate and student behaviors are important variables in the instructional effectiveness of critical thinking (Beyer, 1991). Students can gain critical thinking skills in environments where they can express their thoughts independently, explore problems by questioning, and are continually engaged in active thinking (Halpern, 2003). Therefore, the class should be at an ideal size to allow managing gradual strategies like Hilda Taba strategies. This is supported by the opinions of the participants as well. All of the teachers participating in the study stated that they would use these strategies when working with gifted students because they foster the development of students and create a positive classroom atmosphere.

To summarize, based on the views of the participants who have experience or will work with gifted students, Hilda Taba strategies can be considered as a viable option for differentiating instruction and promoting analytical thinking in gifted education. The participants in this study highlighted the advantage of these strategies in supporting various thinking skills. However, they also acknowledged that implementing these strategies in crowded classrooms might pose challenges in terms of classroom management. It is important to note that this study was limited to participants enrolled in a postgraduate program in the field of gifted education. Future research could focus on experimental studies that examine the use of teaching strategies in resource rooms or specialized environments like Science and Art centers, involving teachers who will work directly with gifted students. Moreover, gathering the perspectives of gifted students themselves regarding the implementation of these strategies could provide valuable insights. Additionally, obtaining teacher feedback during the actual implementation of the strategies in practice could lead to the identification of effective solutions for addressing implementation-related issues.

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