Investigation of 6th-Grade Gifted Students' Perceptions and Anticipations of Four Assessment Methods

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Abstract

Gifted students are future leaders in society. In order to support and encourage them, it's important to have a thorough understanding of the nature of giftedness and the perceptions, and anticipations of gifted students. Therefore, the purpose of this study is to investigate the perceptions and anticipations of 6th-grade gifted students about four commonly used assessment methods, namely, exams, homework, project and performance assessments, and in-class assessments in mathematics classes. The present study is a case study, which is a type of qualitative methodology. The participants of this study consisted of three 6th-grade gifted students who attended Science and Art Centers (BİLSEM) in Ankara. To collect the data, semi-structured interviews were conducted, and data were analyzed through content analysis. The findings indicated that although their perceptions and anticipations varied, three gifted students mostly like project and performance assessments out of these four methods, prefer group assessment to individual assessment, and do not like exams and excessive amounts of homework. In addition, the reflections of gifted students' perceptions can be seen in their anticipations. The findings of this study would be helpful to provide teachers and researchers insight into the perceptions and anticipations of gifted students regarding the assessment to diversify assessment, which would contribute to revealing and enhancing gifted students' potential.

[This paper was published in: "EJER Congress 2023 International Eurasian Educational Research Congress Conference Proceedings," Ani Publishing, 2023, pp. 675-685]

Keywords: *Gifted, Homework, Project and performance Assessment, Exam, In-class assessment, Mathematics Education*

Introduction

Gifted students are promising individuals in the development of society. To encourage gifted students in that regard, it is crucial to understand the nature of giftedness. The Ministry of National Education [MoNE] defines gifted students as follows: "Gifted students are those who differ significantly from their peers in respect of their individual and developmental characteristics and educational qualifications." (MoNE, 2022, para. 1) . Gifted students have some special characteristics, which include being task-committed and creative (Sternberg & Kaufman, 2018) and having the capability to learn independently (Winner, 1996) and quickly (Callard-Szulgit, 2010). Even more than that, they are known to be nonconformist and curious (Callard-Szulgit, 2010). These characteristics have brought along different intellectual and emotional needs, such as demanding more challenging tasks, teachers' support, and peer acceptance (Özdemir & Işiksal-Bostan, 2021; Karatas-Aydın, 2021; Winner, 1996). Therefore, meeting the diverse needs of gifted students is essential to assist gifted students in enhancing their potential (Özdemir & Işiksal-Bostan, 2021). Since assessment is an integral part of education (Abosalem, 2016), using various assessment methods based on the needs of gifted learners might be helpful to help gifted students reach their maximum performance. Before delving into this issue, discussing the purposes of assessment might be helpful.

Assessment has a vital role in education by guiding both teachers and students. More specifically, it provides insight into students' knowledge and adaptability to use that knowledge (National Council of Teachers of Mathematics [NCTM], 1995). In addition to assessing the performance of both the students and the educational system to make decisions about the learning process, assessment also motivates students to learn (Abosalem, 2016). According to NCTM (1995), assessment allows one to gain a perspective on student learning, weaknesses, and strengths. Moreover, assessment has been used for assigning grades, giving feedback to students, monitoring their progress, and enhancing both learning and teaching (Newton, 2007). In 2014, NCTM published the book *Principles to Actions*, which includes six principles and classroom practices that are required to become an effective mathematics teacher. Assessment is one of those principles (NCTM, 2014). In *Principles to Action*s, the use of multiple assessment methods to evaluate the performance of a diversity of learners is suggested (NCTM, 2014). In addition, it has been emphasized by many researchers that increasing diversity requires differentiation in assessment (e.g., Dunlop, 2018; Majuddin et al., 2022). The

differences that are caused by the increasing diversity of learners are also noted in the mathematics curriculum in Türkiye. The assessment approach of the mathematics curriculum is to consider individual differences and to use various assessment methods to meet the needs arising from these differences (MoNE, 2018). Considering that gifted students also have different intellectual and social needs (Özdemir & Işiksal-Bostan, 2021; Karatas-Aydın, 2021; Winner, 1996), it can be said that gifted students may also need differentiation in assessment in mathematics education (Aygün, 2022). Thus, to have an insight into what kind of differentiation gifted students need, it would be helpful to investigate the perceptions and anticipations of gifted students about assessment methods used in their mathematics classes. Hence, this study aims to examine the 6th-grade gifted students' perceptions and anticipations about four commonly used assessment methods in mathematics classes: exams, homework, projects and performance assessments, and in-class assessments. The findings of this study might be helpful for mathematics education researchers and mathematics teachers to have an insight into gifted learners' perceptions and anticipations about assessment methods and might open the way for further studies on differentiated assessment methods for gifted students.

Research Question

What are the perceptions and anticipations of 6th-grade gifted students toward the four assessment methods (exams, homework, projects/performance assessments, and in-class assessments) that are used in mathematics classes?

Method

Research Design

In this study, qualitative research methodology was used to investigate the perceptions and anticipations of 6th-grade gifted students. The qualitative research methodology was appropriate for this study since it provides a more detailed and in-depth understanding (Cresswell, 2012; Fraenkel et al., 2012). Moreover, the case study is a comprehensive investigation of a few or a group of individuals (Cresswell, 2012; Fraenkel et al., 2012). Therefore, the present study's design is a case study since this study aims to deeply examine the perceptions and anticipations of gifted students.

Research Sample

Participants were selected by purposive and convenience sampling in accordance with the purpose and design of the study. Since this study aims to examine the perceptions and anticipations of gifted students, the participants were selected from those identified as gifted and those available for the study. In this study, the participants were named Student 1, Student 2, and Student 3 to ensure confidentiality. The participants consisted of three 6th-grade gifted students (two female: Student 1 and Student 3, and one male: Student 2) who attended Science and Art Centers (BİLSEM) in Ankara. While two students (Student 2 and Student 3) were studying in a public school, one student (Student 1) was studying in a private school, and all students' last grade point averages were 98 out of 100. Moreover, none of the three students' areas of giftedness have been identified yet. Finally, two students (Student 2 and Student 3) enrolled in BİLSEM from the 3rd grade, and the other student (Student 1) from the 2nd grade.

Research Instrument and Procedure

In order to collect the data, an interview protocol was used. The interview protocol was prepared by the researchers, and it consists of questions for three main parts, namely, background information, perception, and anticipation. The background information part consisted of questions such as the school the students attended and their grade point averages. Moreover, the second part consisted of questions related to the perceptions and views of participants about four assessment methods: namely, exams, homework, project/performance assessments, and in-class assessments. The assessment methods selected for this study are the ones that researchers have commonly observed in mathematics lessons. The questions in the perception part were adapted from Birgin's (2008) study on students' views on the use of portfolios as an assessment method in mathematics lessons, in accordance with the purpose of this study. Besides, the questions related to the anticipations of the participants about the four assessment methods were prepared by the researchers.

Two researchers conducted semi-structured interviews via Zoom as an instrumentation method. All the interviews were recorded after getting permission from the participants and their parents. During the interviews, probing questions such as "You mentioned that you dislike exams, why do you think so?" were asked the participants in addition to the questions in the interview protocol to deepen information and clarify the participants' responses. After each interview, the

researchers met on Zoom, reflected on what went well in the meeting and what could be improved, and planned the next meeting accordingly.

Data Analysis

Content analysis was used to analyze the data. Before analyzing the data, all the interviews were transcribed. Afterward, participants' responses were categorized. The authors coded the data individually and then met and discussed their coding and categorization. Records were reviewed in case of disagreements, and discussions continued until a 100 % consensus was reached. Two main categories emerged from the data related to perception: "*like*" and "*dislike*". Three sub-categories appeared under the *like* category: motivation, encouragement to research, and feasibility of understanding. On the other hand, five sub-categories appeared under the *dislike* category: demotivation, anxiety, excessive work, unfairness, and limitations. Besides perceptions, six categories emerged from the anticipation data: *way of assessment*, *question type*, *content*, *condition*, *grading*, and *feasibility of understanding*. Two sub-categories appeared under the *way of assessment* category, which are written/verbal assessment and individual/group assessment. Moreover, three sub-categories were derived under the *content* category, namely, direct information/interpretation, drill type/ skill-based, and interesting context. Two sub-categories arose under the *condition* category, which are exam environment and amount of time. Furthermore, two sub-categories were derived from the *grading* category, namely, fair grading and high grades.

Results

Perceptions of Assessment Methods

Even though their perceptions differed, the results of the present study revealed that three gifted students *like* project and performance assessments most among the four methods (exams, homework, projects/performance assessments, and in-class assessments). All of them explained their reasons for liking the project and performance-based assessment as it enables them to encourage research. While Student 1 *dislikes* other methods, Student 2 *likes* all of them except exams, and Student 3 *likes* homework and in-class assessments in addition to project and performance assessments. However, although Student 3 *likes* the project and performance assessments, she criticized the teachers for unfairly assessing students' performance on the project and performance assessments. Moreover, all students stated that they *disliked* exams

because of the limitations of the exam. More specifically, Student 1 complained that she gets bored since the exams are held in a quiet environment. Also, Student 1 and Student 2 stated that during the exam, they might be distracted even due to the small sound in the quiet exam environment. Unlike the other two students, Student 3 dislikes exams because of the time limitation. Moreover, she asserted that exams are unnecessary and make her anxious because of the time limitation and declared that exams should be conducted not for grades but for students to practice. On the other hand, the other two students asserted that grades are the extrinsic motivation for them. Furthermore, all students indicated that they *dislike* excessive amounts of homework, while Students 2 and 3 demonstrated that a sufficient amount of homework is necessary because of the feasibility of understanding. In addition, while Student 2 expressed that excessive amounts of homework demotivate him, Student 2 and Student 3 affirmed that a sufficient amount of homework motivates them. When it comes to in-class assessment, Student 2 did not state explicitly his reasoning behind why he *likes* in-class assessment, but Student 3 said that she *likes* in-class assessment because it enables her to explain her ideas.

Anticipations From Assessment Methods

Like their perceptions, gifted students' anticipations from assessments varied. The reflections of the students' perceptions can be seen in their anticipations. More specifically, all three gifted students dislike the exams because of limitations such as time constraints and a distractive environment in exams. As was foreseeable, they expect the exam *conditions* to be improved to be held in a quieter environment and over a more extended time. Direct quotation of Student 1 reflects her perception and, accordingly, her anticipation about the exam environment:

Student 1: *...For example, if someone drops their pen, which causes sound, or the rustle of paper may distract my concentration…The exams should be conducted with fewer people to focus better on the exam.*

The reason why the student dislikes homework is that it is time-consuming. Therefore, she anticipates homework that she can do in a shorter time.

Student 1: *… I dislike homework because it is time-consuming… Five skill-based problems would be enough for daily homework…*

Moreover, time manifests itself in students' anticipations about the *way of assessment* and *question type*. Specifically, one of the students prefers essay-type questions because she thinks that she can answer faster, while two of the students prefer multiple-choice questions because they are easier to answer. Besides, all students prefer to be assessed as a group to save time. In addition to saving time, the reasons for gifted students' anticipation of group assessment varied:

Student 1: *I would like to work with a maximum of 3 people, so there would be team spirit. When there are 5-6 people, it can be more difficult to divide the work, and some groupmates may not perform their responsibilities.*

Student 2: *When I am assessed as a group, I can see my contributions to others, allowing me to compare myself with others.*

Student 3: *Group work requires more discipline, making the work better.*

Also, students' anticipations for a *way of assessment* differed as written and verbal for in-class assessments. Two students pointed out that they preferred written assessments to oral assessments and explained the reason for this as it is easier to express themselves in writing. On the other hand, the other student stated that written or oral assessments made no difference for him.

Furthermore, students' expectations about the *content* of tasks that require direct information or interpretation varied. While student 1 indicated that question type does not matter to her, student 2 prefers interpretation-based questions and explained his reasoning that he dislikes memorizing. In addition, Student 3 prefers questions that require direct information and explain her reasoning as follows:

Student 3: *Direct information-based questions are better because I think the questions based on interpretations assess reading and writing skills rather than mathematics, as they are generally composed of paragraphs.*

Furthermore, two of the gifted students indicated that the content of the assessment should be interesting. Direct quotations of these students are given below:

Student 3: *The content of project/performance assessments should be interesting and in-class assessments should include games, etc.*

Student 1: *I would give my students projects and performance assessments about the history of mathematics … because it is necessary to learn the history of mathematics to enable the feasibility of understanding of a math subject.*

In addition, one of the students also expects that the *content* of homework should consist of both drilling questions and skill-based questions because of the *feasibility of understanding*, while another one expects the same for exams. Moreover, one of the students, who criticized the project and performance assessment as unfair, expected fair *grading*, while another student expected to get high *grade*s from four assessment methods.

Discussion, Conclusion, and Recommendations

Discussion

The findings of this study show that the most preferred assessment method for three participants is project and performance assessments because they require investigation. This is not surprising considering gifted students' characteristics of curiosity (Callard-Szulgit, 2010). However, similar to students' views in the study of Tezer and Ozrecberoglu (2015), in our study, one of the students indicated that project and performance assessment might not be fair because all teachers do not use a common assessment criterion. Moreover, they all anticipate more interesting assessment tasks, which support the findings in the studies of Özdemir and Işiksal-Bostan (2021). Besides**,** according to Winner (1996), gifted students have a tendency to work independently, so based on this characteristic of gifted students, we expected that they would prefer to be assessed individually; however, all of the students prefer to be assessed as a group to save time. Moreover, considering the ability of gifted students to be proficient verbally (Callard-Szulgit, 2010), it would be expected for students to prefer essay-type questions, but two out of three students preferred multiple-choice questions as they answered them more quickly and easily, so they save time. Özdemir and Işiksal-Bostan (2021) found that most gifted students dislike homework because they think non-challenging and routine tasks waste their time. Similarly, in the present study, all the participants do not like excessive homework because it consumes their time and demotivates them.

Conclusion

The present study concludes that the perceptions and anticipations of gifted students about four assessment methods (exams, homework, projects/performance assessments, and in-class assessments) varied. The characteristics of gifted students were reflected in their perceptions and anticipations. The reflections of students' perceptions were observed in their anticipations. Future studies could be conducted to investigate the relationship between the perceptions and anticipations of gifted students regarding assessment. Hence, in light of the findings of this study, the following recommendations for mathematics teachers and mathematics education researchers could be made.

Recommendations

The findings of this study may be helpful for teachers to have an insight into the gifted students' perceptions and anticipation about commonly used assessment methods in the classroom. In light of these insights, teachers should diversify assessment methods based on the needs of their gifted learners, which would also be helpful for their gifted learners. Moreover, this study may inspire researchers to conduct future studies about differentiated assessments for gifted students.

Despite the valuable findings of this study, it has some limitations. Firstly, all participants' grade levels were the same (6^{th}-grade students). Furthermore, all three students had the same grade point average of 98, so it can be said that all three were high achievers. For these reasons, future studies could be conducted with more participants with various grade levels and levels of achievement to examine whether and how these variables affect the perceptions and anticipations of gifted students regarding assessments.

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