Assessing Mathematics Teachers' Perspectives of Gifted and Talented Education in Saudi Arabian

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Abstract The importance of gifted education is being acknowledged worldwide for its impact, on economic growth and Saudi Arabia is no different in valuing this field of education highly. In this research study of a nature the focus is on how mathematics teachers perspective their effectiveness in teaching gifted students in standard classrooms, across Saudi Arabia. A survey was conducted using a 5-point Likert scale consisting of 20 items. Was completed by 130 math teachers who are actively engaged in gifted education. This research centers, on two areas of interest regarding teachers efficacy and abilities to support students and their views on the success of existing programs for gifted education. The results show that teachers generally have views on their competence in teaching students and express confidence in their understanding of the needs of these learners and, in using suitable teaching methods. However, teachers expressed critical views regarding the effectiveness of existing gifted programs. Significant variations in perspectives were observed based on teachers' educational levels, with those holding master's degrees showing perspective that is more positive. Regression analyses further confirmed a notable correlation between higher educational attainment among teachers and positive perspectives of gifted education. The study concludes with recommendations for enhanced professional development opportunities, curriculum adaptation, and policy support to improve the educational outcomes of gifted students in Saudi Arabia.

Keywords: Gifted education, Mathematics Teacher perspectives, Teacher competency, Gifted programs, Professional development.

Introduction

In rapidly developing countries, the importance of gifted education programs has surged due to the economic potential and human capital value that gifted and talented individuals bring to a country. Due to this, there is a greater international concern on the standards of gifted education which encompasses Saudi Arabia where such programs have only recently been integrated into the school systems. Numerous components aid in the success of these programs, but one key element that international studies emphasize is the impact of teachers' views and perceptions about gifted and talented students (Alamiri, 2020). This is highly relevant in the context of Saudi Arabia because teachers do have a lot of influence regarding the education of gifted students. Nonetheless, there appears to be a lack of information in Saudi Arabia concerning the outcomes of government policies on gifted education. There seems to be insufficient study on the teachers' perceptions and their understanding of gifted and talented students in mathematics (AlAli 2020).

Saudi Arabia is making strides in enhancing its education system to support the development of all students' potential (Alfaiz, Alfaid, & Aljughaiman, 2022). Particularly focusing on gifted

individuals to ensure they are adequately challenged, and their abilities are effectively utilized. Gifted students face the risk of underperforming if they do not receive a curriculum tailored to their needs and capabilities (Aljughaiman & Grigorenko, 2013). A teacher's expertise isn't the factor affecting how students learn – their perspectives also hold sway in shaping classroom dynamics and teaching approaches that ultimately impact student education outcomes. (Wardat et al., 2023; Johnsen, 2021). Although it is crucial to meet the requirements of gifted students, conventional classroom teachers frequently lack enough training in this domain (Mullen & Jung, 2019). Therefore, conducting empirical and descriptive studies on the education of gifted students, particularly in relation to teacher attitudes and knowledge in Saudi Arabia, is beneficial as it can contribute to the success of gifted programs.

This investigation focuses on understanding the perception of gifted and talented students by mathematics teachers and provides an in-depth overview of such perceptions. Such an overview makes it possible to construct a comprehensive evaluation theory of effectiveness with regard to instructional learning for gifted students. Furthermore, the analysis looks into teacher competence and the effectiveness of gifted education programs. The unique aspects of this research study concern what steps are necessary to improve the education of the gifted students. For example, what should be done to improve the training and professional development of mathematics teachers in Saudi Arabia. Also, what other changes should be made to the existing gifted education programs to make them more effective. Apart from that, this research contributes towards filling the gap in literature on the perceptions and knowledge of mathematics teachers on gifted education outside the Saudi context.

Study Purpose

The primary objective of this research is to investigate the perspectives of mathematics teachers in Saudi Arabia regarding gifted and talented kids in their courses. In particular the research aims to examine and interpret the perspectives of mathematics teachers on teaching students in education settings with a focus on how teachers assess their own abilities, and the success of programs created for these exceptional learners. Moreover, the investigation aims to evaluate how competent mathematics teachers feel when it comes to meeting the requirements of gifted students. Exploring how teachers about their skills, in teaching and connecting with students is important, for recognizing what they excel at and where they can improve in methods and programs.

One important goal is to explore how teachers' perspectives are the success of education programs for gifted students. Additionally, the study seeks to gain an understanding of both the negative aspects of these programs from the perspective of the teachers who use them. This research aims to offer perspectives that can influence the improvement and advancement of these initiatives. Furthermore, the study looks to guide approaches by offering perspectives that can impact how professional development programs, for teachers are created and put into practice. Teachers can improve their teaching methods. Elevate the quality of education for gifted students by understanding the perspectives and difficulties they encounter in their roles.

Finally, this research seeks to enhance the existing knowledge, on talented students' education through providing real world insights into teachers' viewpoints and expertise in the discipline of

mathematics education in Saudi Arabia. This research bridges the research gap by shedding light on the perspectives of mathematics educators regarding talented students' education in Saudi Arabia. This work sets a foundation for investigations and policy development efforts that could enhance talented students' education by underlining the significance of teachers' perspectives and skills in effectively executing programs, for gifted students.

Study Significance

The importance of this research is, in its ability to improve the knowledge and application of gifted education, in Saudi Arabia as the nation works towards improving its system to support all students' maximum development potential including those identified as gifted individuals. This research offers valuable perspectives from mathematics teachers, about gifted and talented students showcasing various crucial aspects.

Understanding teachers' perspectives is essential, for enhancing the quality of gifted education as teachers have an influence on shaping the learning experiences of gifted students and their attitudes significantly affect student involvement and success levels, in education programs.

Furthermore, the research delves into how math teachers are equipped to cater to the requirements of talented students based on earlier findings suggesting that most general education teachers are ill-prepared to instruct gifted learners effectively. This investigation could guide the creation of tailored training initiatives that enrich educators' abilities and expertise resulting in improved academic success, for gifted students.

The study also assesses how well current programs, for gifted students work according to the teachers who use them. Acknowledging teachers' perspectives, on these initiatives can uncover their advantages. Identify areas that need enhancement. This feedback can help policymakers and teachers improve and optimize these programs for the benefit of gifted students.

In addition, to that point about the study's results having an impact on how education's done, and rules are made in schools and universities. These findings can help improve teaching techniques and actions based on evidence. Make sure teachers feel more confident about themselves while also enhancing the educational journey for gifted students through targeted interventions with a focus on boosting self-belief, among educators and enhancing the learning journeys of gifted pupils overall. All of which could result in a more nurturing and fulfilling academic setting that nurtures the skills and capabilities of exceptionally gifted students.

This research adds to the collection of studies, on gifted education with a focus on Saudi Arabia specifically. It highlights the research in this field. How little is known about math teachers' perspectives and expertise in this context. The study's results aim to address this gap by laying the groundwork for studies that can inspire investigation and the advancement of effective strategies, in gifted education.

Research Questions

1. What are the perspectives of math teachers regarding the education of gifted and talented students' in Saudi Arabia?

2. Do the perspectives of educators towards gifted and talented students' education in Saudi Arabia differ by gifted, gender, educational level, or experience?
3. How do a teacher's level of education and work experience influence his or her perspectives of the competency to teach gifted students and the implementation of the talented programs at their schools?

Theoretical Framework

The theoretical framework of this research, on math teachers' perspectives in Saudi Arabia gifted and talented students draws from theories, in educational psychology and teacher perception studies This framework helps us grasp the factors shaping teachers' perspectives and how these perspectives affect gifted students' educational success.

According to Albert Banduras theory of self-efficacy (1997) individuals' confidence, in their ability to perform tasks to handle situations greatly impacts how they tackle goals and challenges alike. From the perspective of this research project teachers' self-efficacy. Their confidence, in their capacity to effectively educate gifted students. Can greatly shape their teaching methods and overall outlook on education initiatives. Teachers who have a belief, in their abilities are likely to view their competence and the impact of education programs more positively.

Tomlinsons theory of differentiated instruction highlights the importance of customizing teaching methods to suit students diverse learning needs and preferences (Tomlinson 2001). This approach is especially crucial, in gifted education to provide tailored and stimulating learning opportunities for students, with abilities and requirements.

According to the theory proposed by Pajares in 1992 regarding teachers' perceptions and attitudes, in the classroom significantly influence their interactions with students and instructional practices which can ultimately impact student outcomes well. In order to enhance education strategies effectively understanding teachers' perspectives on gifted students and the influencing factors becomes essential. Teachers' outlook towards gifted education plays a role in determining their level of involvement and support, for programs designed for gifted students.

Conceptual Framework

The study incorporates these perspectives to analyze the constructs illustrated in Figure 2.

- Teacher Self Efficacy refers to a teacher's confidence in their ability to effectively teach talented and gifted students.
- Teachers Perspectives and Attitudes regarding education and their confidence, in their own abilities.
- In the setting of Saudi Arabia schools and institutions of learning it is important to take into account the framework of education which includes curriculum guidelines, regulations and training opportunities, for mathematics educators who focus on facilitating the development of gifted students.
- Teachers, in general education settings are being studied to understand how they perceive the effectiveness of existing gifted education programs in terms of outcomes achieved and the

support structures provided as well as their experiences collaborating with colleagues, on these programs.

The research seeks to offer an insight into the factors that shape the views of math teachers regarding gifted education, in Saudi Arabia with the goal of enhancing educational methods and policies effectively.

Figure1: Overview of Teaching Methods, for Gifted and Talented Students in Regular Education Classrooms, in Saudi Arabia.

Literature Review

Teachers have a role, in recognizing and fostering gifted students, in schools and providing them with the support they need to succeed academically and personally.

Role of Teachers in Gifted Education

Teachers play a role, in nurturing the development of gifted students by serving as guides who can foster their intellectual and emotional growth within a supportive setting according to Renzullis (1978) Three Ring Conception of Giftedness theory that views giftedness as a complex concept that demands personalized education and conducive learning environments guided by experienced educators. This theory underscores the importance of teachers, in identifying and nurturing the talents of students through tailored teaching methods and enriching educational experiences as emphasized by Sternberg & Davidson (2005).

The definition of giftedness has a broad perspective and with the help of cognitive science and psychological research, many abilities have been stimulated. Educational theories and psychological frameworks have shown that the development of gifted learners is greatly influenced by their educators' beliefs and knowledge (Abu Nasser & AlAli, 2022; El Khoury et al., 2018).

One of the most important factors in creating a gifted education program is how teachers view their pupils who are gifted. Therefore, it becomes important to understand the opinions of teachers in general education and the overall effectiveness of the interventions designed to enhance gifted education. (Furnes & Jokstad, 2023). This research delves into two primary concepts: educators' competency of teaching gifted and talented students, and their opinions regarding gifted and talented educational programs (Johnsen, 2021; Mullen & Jung, 2019; Renzulli & Reis, 2021; Smedsrud, 2020).

Teacher Competency and Knowledge in Gifted Education

Equally important is the role of a teacher in identifying and assisting gifted students with research emphasizing the importance of teachers' knowledge and awareness in gifted education. For instance, Plucker and Callahan (2014) pointed out that delineating the understanding gifted students have about their distinct and unique features is fundamental towards achieving is a very basic requirement for educators and forms primary decision bound within their teaching philosophy. In the same manner, Pishghadam et al. (2018) noted that there is a positive relationship between education in professional development and teaching gifted students towards the view of the teachers and their approach on the teaching of the gifted, which justifies the need for training and more attention.

Among the classes where gifted learners learn with other students who do not have programs designed for them, these students are taught by teachers who have knowledge in particular areas of the subject and not in gifted education. Research has shown that there are variations in how these students are educated because teachers often lack the necessary understanding, training and awareness of the unique needs of gifted learners. For example, studies have revealed that gifted students often do not receive attention from their classroom teachers due to heavy workloads and a lack of knowledge, about how to cater to their individual learning needs. One more study comparing trained and untrained teachers of gifted students revealed that trained teachers were more responsive to the cognitive needs of the gifted, engaged more in pedagogical strategies that promoted high-level thinking, supported independent learning, and used creative teaching methods (Mohamed & Elhoweris, 2022; Abu, Akkanat, & Gökdere, 2017).

The NAGC and CEC, in the United States have established ten guidelines for teacher training that outline the necessary knowledge teachers should possess regarding students and their education needs. It is essential for both regular and gifted educators to be familiar with these standards since many gifted students are taught in classrooms, with a shared curriculum and setting. It is important to outline the knowledge and abilities needed to effectively teach gifted and talented students as this plays a significant role, in shaping teacher education programs (Plunkett & Kronborg, 2011; Vidergor, 2015; AlAli et al., 2024) Have also emphasized the significance of this aspect.

Teachers' Perspectives and Attitudes towards Gifted Education

Research indicates that teachers' perspectives and attitudes towards gifted education vary based on factors such as training, experience, and institutional support. In a study by Aksoy and Koklu (2019), Turkish teachers expressed positive attitudes towards the importance of differentiated instruction for gifted students but reported challenges in implementing effective practices due to

limited resources and support. Similarly, a study conducted by Al-Eraky et al. (2020) in Saudi Arabia revealed that while teachers recognized the importance of gifted education, they faced barriers related to curriculum constraints and lack of specialized training.

Teachers' viewpoints play a role in shaping classroom dynamics. Instructors who exhibit outlooks often establish nurturing settings that cater to the requirements of pupils (Mohamed & Elhoweris 2022). AlAli & Wardat (2024) also emphasized the role of teacher encouragement in the achievement of gifted students. On the contrary a pessimistic attitude, from a teacher can dampen the spirits of individuals resulting in a loss of motivation to succeed. Jarrah and Almarashdi (2019) proposed that teachers often shape their students' attitudes to align with their beliefs. Meaning that a teachers positive or negative view of students can subtly impact how the students perceive themselves as well. They also highlighted the influence of teacher attitudes, on the development of programs for gifted students and emphasized the importance of these attitudes in creating effective programs, for gifted individuals. Abu et al. (2017) as Plunkett and Kronborg (2011) highlighted the limited understanding of teacher views, on gifted students and gifted education. There is a growing recognition in research of the significance of teachers' viewpoints on teaching students, in mainstream classrooms (AlAli & Abunasser, 2022; Jarrah & Almarashdi, 2019 ; Lassig 2015).

Jarrah and Almarashdi's (2019) research, a quantitative study in the UAE, surveyed 66 mathematics teachers to gauge their views on teaching gifted learners. Findings indicated positive attitudes toward teacher competency but negative perspectives regarding program effectiveness. Expanding the study beyond Al Ain city could yield more comprehensive insights. Lassig (2015) emphasized teachers' pivotal role in shaping gifted students' education. Investigating 126 Australian primary teachers across eight schools, the research unveiled connections, between teachers' perspectives and school classifications (significant, at $p < .001$). and participation in gifted education training ($p < .001$), highlighting the need for enhanced teacher training. Mullen & Jung (2019) examined factors influencing teachers' attitudes towards gifted programs. Surveying 182 Australian teachers, they found perceived knowledge of giftedness positively predicted program support and negatively correlated with elitism perspectives. Primary teachers exhibited greater program support. Surprisingly, extensive contact with gifted individuals inversely affected support. Drawing from research findings indicates a requirement, for a comprehensive examination of the viewpoints of math educators towards talented students, across various educational stages.

Effectiveness of Gifted Education Programs

Gifted education programs play a role, in research and development areas are fundamental to investigation purposes for effective results tailored for gifted students leading to improved academic performance and social emotional growth but show variations, in effectiveness based on educational settings. In one instance mentioned by Wang et al. (2017) as an example, from their meta-analysis study indicates that inclusive programs for students, with a mix of enrichment activities and specialized curricula can result in outcomes for these students highlighting the significance of how programs are structured and put into practice The objective of gifted education programs is to offer enhanced learning opportunities that extend beyond the usual classroom

teachings tailored to the various talents and passions of gifted students as noted by Robinson in 2008. These software applications frequently focus on enhancing learning speed and offering curricula along, with promoting expression and critical thinking opportunities (Subotnik et al. 2011).

Methodology

Research Design

The research employed a method to assess how math teachers view the instruction of pupils, in regular classrooms, in Saudi Arabia. The information was gathered through a custom survey with 20 items rated on a 5 point Likert scale (where 5 represents agreement and 1 stands for disagreement). This survey format was chosen for its ability to gather data on perspectives and attitudes from participants efficiently without resource constraints.

Population and Sample

The study population consisted of all teachers of mathematics in government schools in the eastern region of Saudi Arabia in the academic year 2023/2024. The sample consisted of 130 mathematics teachers. The sample was distributed according to gifted, gender, educational level, experience, and training courses, as shown in Table 1 below.

		Frequency	Percent	Valid Percent
Gifted	Gifted	60	46.2	46.2
	Non-gifted	70	53.8	53.8
	Total	130	100.0	100.0
Gender	Male	76	58.5	58.5
	Female	54	41.5	41.5
	Total	130	100.0	100.0
Educational level	bachelor's degree	72	55.4	55.4
	Higher deploma	23	17.7	17.7
	master's degree	35	26.9	26.9
	Total	130	100.0	100.0
Experience	Less than 5 years	16	12.3	12.3
	From 5 to 10 years	36	27.7	27.7
	More than 10 years	78	60.0	60.0
	Total	130	100.0	100.0

Procedures

The first version of the survey was carefully. Then shown to a group of arbitrators to guarantee its content validity was met. After they reviewed it and made some changes as needed the survey got the light, from the Scientific Research Ethics Committee showing that it aligns with guidelines.

To confirm the validity and reliability of the tool used in the study's design process was verified through a pilot study carried out initially on a diverse group of participants who were given a draft of the survey to pinpoint and correct any possible flaws that may exist.

After confirming the accuracy of the information provided and obtaining approval, for the study's protocols and methods we began collecting data by sending out the updated questionnaire to individuals in the research sample who were chosen from schools in the part of Saudi Arabia to create a thorough and inclusive dataset, for our investigation.

The Instrument

An instrument was meticulously developed following a comprehensive review of relevant literature and prior studies. This process involved clearly defining the objective and dimensions of the instrument, followed by the careful formulation of its elements. The main goal of the tool is to explore how mathematics teachers, in Saudi Arabia view talented students and evaluate their opinions on the success of existing education programs in the country. The tool includes two constructs. A scale for assessing teaching Competence for gifted students with 10 items and the second one on teaching for gifted students with another 10 items. The complete tool comprises a total of 20 items altogether.

Verifying the validity and reliability of the instrument

Nine experts, including educational supervisors and faculty members specializing in curricula, teaching methods, and measurement and evaluation, rigorously reviewed the checklist to ensure its validity. Their primary focus was to confirm that each item accurately corresponded to the dimension it was intended to measure and that the overall checklist was suitable for achieving its stated objectives. The experts unanimously agreed on the appropriateness of the instrument, affirming its relevance and utility. Additionally, they recommended the reformulation of certain items to enhance clarity and ensure precise understanding.

To evaluate the Instrument, the following equation was employed: (the highest value of the scale -the lowest value of the scale)/number of levels. Specifically, (5−1)/5=0.80. In this research projects survey scale consisted of five response choices which were numbered 1 through 5 The purpose of using these numbers was to group the answers into levels representing agreement or perception Each level was described as follows: Highly negative responses ranged from 1.00 to 1.80, negative responses ranged from 1.81 to 2.60, ambivalent responses ranged from 2.61 to 3.41, positive responses ranged from 3.42 to 4.22 , and highly positive responses ranged from 4.23 to 5.0. This categorization helped us understand the participants' perspectives in a way and allowed for an analysis of the gathered information.

Indicators and Coefficients of Construct Validity

McDonald's omega and composite reliability (CR) are commonly employed to assess the reliability of observational instruments. The results presented in Table 2 indicate that McDonald's omega values range from 0.897 to 0.956, while CR values range from 0.899 to 0.959. Both sets of values exceed the recommended threshold of 0.7, suggesting that the observation checklist exhibits substantial internal consistency.

Additionally, the average variance extracted (AVE) values range from 0.595 to 0.615, all of which are greater than the 50% benchmark. This further supports the validity of the checklist. Regarding

discriminant validity, the final column of Table 2 shows that the square root of the AVE for each construct is greater than the corresponding minimum value of the loading factor, as required.

These findings collectively demonstrate that the observation checklist is both reliable and valid, making it a robust tool for the intended research purposes.

Table 2 Indicators and coefficients of construct validity

Constructs	Items	McDonald's ω	CR	AVE	$\sqrt{AVE}$
Teachers' Perspectives of Their Competency in Teaching Gifted and Talented Students dimension.	10	0.935	0.936	0.595	0.772
The Teaching Gifted and Talented Students dimension.	10	0.939	0.939	0.615	0.784

To validate the structure accurately and effectively analyze the relationships, among latent constructs in the dataset Confirmatory Factor Analysis (CFA) a form of Structural Equation Modeling (SEM) was utilized. This statistical approach is valuable, for creating measurement tools evaluating construct validity and classifying influences. In the process of developing a tool, for testing purposes in psychology evaluation fields and studies; Confirmatory Factor Analysis (CFA) plays a role, in evaluating the underlying structure of the tool by assessing its core dimensions and factor loadings.

The questionnaires validity was confirmed in this research through CFA analysis method using SEM in AMOS version 25.o The model depicting the relationship, between the questionnaire items was. Parameter estimates were calculated using maximum likelihood estimation method as displayed in Figure 2.

To ensure the accuracy of the factorial construct validity, in the study sample the final version of the scale was given to participants. A confirmatory factor analysis was conducted to assess how well the scale items align with their dimensions. It was important to establish the weight of each item on its dimension while creating the scale. Items with loading factors below 0.40 were not included based on the criteria, for item retention (Saleh & AlAli 2024). The findings showed that each item had loading factors above 0.40 in their corresponding dimensions.

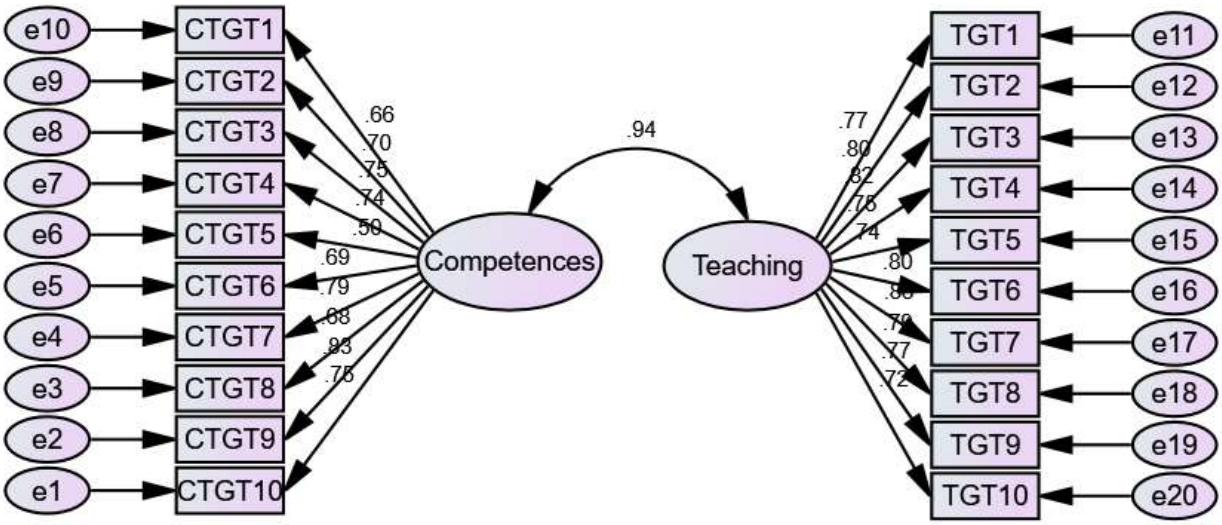

Figure 2. The findings, from the confirmatory factor analysis that aimed to determine how the scale items are connected to their corresponding dimensions and the extent of loading.

Results

In exploring the first question, about math teachers perspectives on the education of gifted and talented students in Saudi Arabia, the study found that math teachers held differing views about teaching gifted students. Although they felt confident in their teaching skills for learners they were not in favor of incorporating programs in schools. The survey findings with information including scores and ranges, for all 20 items can be found in Table 1.

Table 1. Results of evaluating how Math Teachers View Gifted Students in the two dimensions

	Items	Mean	St. Dev.	Rating (categorized)
1.	I feel knowledgeable about the characteristics and needs of gifted and talented students.	3.56	1.21	Positive
2.	I understand the methods used to identify gifted and talented students.	4.31	1.34	highly positive
3.	I am confident in my ability to teach gifted and talented students effectively.	3.83	1.62	Positive
4.	I am capable of developing materials for learning to gifted and talented students.	3.97	1.15	Positive
5.	I effectively collaborate with other teachers, particularly new teachers, to support the needs of gifted and talented students	3.87	1.53	Positive
6.	I can adapt the curriculum to meet the needs of gifted and talented students.	3.84	1.37	Positive
7.	I am proficient in using various strategies and teaching techniques tailored for gifted and talented students	4.25	1.25	highly positive
8.	I actively seek out professional development opportunities related to teaching gifted and talented students.	4.40	1.26	highly positive
9.	I am confident in my qualifications and ability to teach gifted and talented students effectively	3.72	1.33	Positive

10.	I effectively integrate technology into my teaching to enhance the learning experiences of gifted and talented students.	4.09	1.38	Positive
Teachers' Perspectives of Their Competency in Teaching Gifted and Talented Students		**3.94**	**1.31**	**Positive**
1.	The applied programs adequately meet the educational needs of gifted and talented students.	3.49	1.40	Positive
2.	The professional development associated with the programs equips teachers with the necessary skills to support gifted and talented students.	3.61	1.25	Positive
3.	Having a student, in my class makes me quite anxious.	2.54	1.30	Negative
4.	Educating gifted and talented students, alongside their peers, in standard classes is not an optimal use of their abilities.	3.94	1.47	Positive
5.	The gifted programs, at my school have exceeded my expectations. I find them quite engaging and fulfilling.	2.97	1.36	Ambivalent
6.	To help talented students progress beyond the curriculum I need to have a deep comprehension of the subject matter.	4.32	1.37	highly positive
7.	"I possess materials to educate students who are gifted and talented	2.41	1.22	Negative
8.	My school administrators show dedication to nurturing the talents of students and ensuring the progress of all learners alike.	3.59	1.39	Positive
9.	I have time to get ready, for instructing students who're gifted and talented.	3.75	1.51	Positive
10.	It's essential to have classroom management abilities when instructing talented students.	4.27	1.39	highly positive
Teachers' Perspectives of the Effectiveness of Applied Programs for Gifted and Talented Students		**3.54**	**1.38**	**Positive**

In Table 1 presented are the scores and standard deviations reflecting math teachers' perspectives on two aspects. Their competency, in teaching gifted and talented students (mean = 3.94; standard deviation = 1.31) and their assessment of the impact of specialized programs, for gifted students (mean = 3.54; standard deviation = 1.38).

In looking at the second question about whether there are any variations, in how teachers view the education of talented students in Saudi Arabia based their giftedness level gender education experience a t test and one way analysis of variance (ANOVA) were carried out The findings, from the t test regarding teacher perspectives are outlined in Table 2 below.

Table 2. Results of t-test for differences between means according to gender and gifted.

	Variables and Dimensions		N	Mean	Std. Deviation	T-Value	Sig.
Gender	Teachers' Perspectives of Their Competency in Teaching Gifted and Talented Students	Male	76	4.2368	.60577	2.596	0.010
		Female	54	3.9864	.60566		
	Teachers' Perspectives of the Effectiveness of Applied Programs for Gifted and Talented Students	Male	76	4.1732	.64659	1.779	0.077
		Female	54	3.9913	.62977		
	Overall Average	Male	76	4.2050	.61024	2.227	0.057
		Female	54	3.9888	.60745		
Gifted	Teachers' Perspectives of Their Competency in Teaching Gifted and Talented Students	Gifted	60	4.1120	.65860	1.141	0.254
		Non-Gifted	70	4.2124	.57808		
		Gifted	60	4.0670	.66503	1.087	0.279

Teachers' Perspectives of the Effectiveness of Applied Programs for Gifted and Talented Students	Non-Gifted	70	4.1672	.63009		
Overall Average	Gifted	60	4.0895	.64945	1.126	0.255
	Non-Gifted	70	4.1898	.58787		

Table 2 shows that there are no variations, in the responses of the sample on the instrument based on gender; the t value is 2.227 and the significance level is above 0.05. In a vein, there were no differences observed in how gifted students responded; the t value stands at 1.126 with a significance level higher, than 0.05 for all aspects considered in the study.

The outcomes of the one-way analysis of variance (ANOVA) as detailed in Table 3 illustrate how teacher viewpoints vary based on their educational level and years of teaching experience.

Table 3. Results of analysis of variance of differences between the means of responses of the sample.

	Variance Source		Sum of Squares	df	Mean Square	F	Sig.
Teaching Experience	Teachers' Perspectives of Their Competency in Teaching Gifted and Talented Students	Between Groups	.222	3	.074	.194	.901
		Within Groups	74.902	196	.382		
		Total	75.124	199			
	Teachers' Perspectives of the Effectiveness of Applied Programs for Gifted and Talented Students	Between Groups	.591	3	.197	.469	.704
		Within Groups	82.355	196	.420		
		Total	82.947	199			
	Whole Scale	Between Groups	.259	3	.086	.225	.879
		Within Groups	75.137	196	.383		
		Total	75.396	199			
Educational level	Teachers' Perspectives of Their Competency in Teaching Gifted and Talented Students	Between Groups	15.208	2	7.604	25.00	.000
		Within Groups	59.916	197	.304		
		Total	75.124	199			
	Teachers' Perspectives of the Effectiveness of Applied Programs for Gifted and Talented Students	Between Groups	10.796	2	5.398	14.73	.000
		Within Groups	72.150	197	.366		
		Total	82.947	199			
	Whole Scale	Between Groups	12.847	2	6.423	20.23	.000
		Within Groups	62.549	197	.318		
		Total	75.396	199			

The results in Table 3 indicate statistically significant differences at the 0.01 significance level in the responses of the study sample concerning teachers' perspectives of their competency in teaching gifted and talented students and the effectiveness of applied programs for gifted and talented students based on educational level. To identify the sources and trends of these differences, the Scheffe test for post-hoc comparisons was employed, as shown in Table 4. Conversely, there were no statistically significant differences in both dimensions and the overall scale regarding teachers' perspectives of their competency in teaching gifted and talented students and the effectiveness of applied programs for gifted and talented students based on teaching experience, as the significance level was greater than 0.05.

Table 4. Scheffe Test Results for Differences in Teachers' Perspectives Based on Educational Levels of Math Teachers

Mean	(I) Rank	(J) Rank	Mean Difference (I-J)	Std. Error	Sig.

4.1770	master's degree	Higher deploma	-.05826	.12548	.975
		bachelor's degree	-.09587	.12674	.903
4.1394	Higher deploma	master's degree	.05826	.12548	.975
		bachelor's degree	-.03761	.09952	.986
4.0812	bachelor's degree	master's degree	.09587	.12674	.903
		Higher deploma	.03761	.09952	.986

Table 4 presents statistically significant differences across all dimensions of the scale concerning teachers' perspectives of their competency in teaching gifted and talented students, as well as the effectiveness of applied programs for these students, based on educational level. These differences favor math teachers with a master's degree.

In exploring the third question, about how teachers' educational backgrounds influence their perspectives on gifted education. Particularly in terms of their ability and competency to teach gifted students and the success of gifted programs, at their schools. A Regression Analysis was undertaken on the pertinent factors.

Table 5. Linear correlation for both dimensions

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.465[a]	.216	.208	.54663
1	.379a	.144	.135	.60048

In Table 5 of the study shows that there is a correlation of 0.47, between teachers perspectives their competency and skills in teaching talented and gifted students and the actual accuracy of these assessments standing at 21.6%. Similarly, the linear correlation coefficient for Teachers' Perspectives of the Effectiveness of Applied Programs for Gifted and Talented Students is 0.38, with an estimation accuracy of 14.4% for this dependent variable.

Table 6. Regression analysis for both dimensions

Model		Sum of Squares	df	Mean Square	F	Sig.
First Dimension	Regression	16.260	2	8.130	27.208	.000[b]
	Residual	58.864	197	.299		
	Total	75.124	199			
Second Dimension	Regression	11.914	2	5.957	16.521	.000[b]
	Residual	71.032	197	.361		
	Total	82.947	199			

Table 6 shows how well the regression line fits compared to the hypothesis stating that "the regression line doesn't match the data given." The analysis of variance test, for the regression line resulted in a value of 27.208 at a significance level of 0.000, which's, below 0.05 confirming that the regression line fits the data provided (Saleh et al., 2023). Additionally, the table demonstrates the suitability of the regression line when compared to the null hypothesis. The analysis of variance test for this regression line yielded a value of 16.521 at a significance level of 0.000, also less than 0.05, indicating that the regression line fits the data.

Table 7. Coefficients for both dimensions

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
First Dimension	(Constant)	3.055	.183		16.703	.000
	Educational Level	.091	.048	.120	1.881	.041
Second Dimension	(Constant)	3.121	.201		15.530	.000
	Educational Level	.104	.053	.131	1.955	.042

Table 7 demonstrates that there are statistically significant differences in the total study scores across the entire scale. The prediction equation is represented as follows: educational level = 3.055 + 0.091X (First Dimension). This indicates that an increase in teachers' educational level correlates with a heightened perception of gifted education, specifically concerning their competence in teaching gifted students. Although interpreting the effect of teachers' educational level via the beta coefficient can be challenging, it is more straightforward to interpret the coefficient using the Z-score for both dependent and independent variables. Thus, the standard value of educational level is 0.120X (First Dimension). Table 7 indicates that there are statistically significant differences in the total study scores across the entire scale. The prediction equation is expressed as: educational level = 3.121 + 0.104X (Second Dimension). This suggests that an increase in teachers' educational level corresponds with a higher perception of gifted education, specifically regarding their perspectives of the effectiveness of applied programs for gifted and talented students. While interpreting the effect of teachers' educational level via the beta coefficient may be challenging, it is more straightforward to interpret the coefficient using the Z-score for both dependent and independent variables. Therefore, the standard value of educational level is 0.131X (Second Dimension).

Discussion

This study focused on exploring how math teachers' perspective their ability to teach gifted and talented students and the effectiveness of programs in schools due to their crucial role, in recognizing and supporting these students. The findings revealed that teachers conveyed generally positive perspectives. These results are consistent with the general findings of previous studies (Smedsrud et al., 2022; Jarrah & Almarashdi, 2019; Allodi & Rydelius, 2008). Specifically, participants in this study indicated positive perspectives of their own competency in teaching gifted students, while their views on the effectiveness of applied gifted programs in schools were predominantly negative. Upon observation, it seems that teachers feel confident, in their competency and ability to educate gifted and talented students. However, they express discontent with the effectiveness of the existing programs.

The results of this research show that teachers hold perspectives on their competency, skills and professional methods, in education field. Some teachers have a perception of their grasp and utilization of techniques for gifted and talented students. They feel assured in recognizing students and using teaching approaches tailored to meet their needs. This indicates that teachers are confident in their abilities to provide support to gifted and talented students, in class. Conversely teachers also mentioned being less proactive, in pursuing opportunities for development that are relevant, to teaching gifted and talented students. This contradiction indicates a gap between

perceived competency and the ongoing professional growth necessary to maintain and enhance that competency. Teachers believe they possess the skills at present; however, their reluctance to participate in development activities could result in a plateau, in their teaching methods over time. This unwillingness could be due to a lack of resources, time or to a putative assessment that their current knowledge is satisfactory. The discrepancy between the professional development evaluative self-appraisal and attendance to the development needs of educators indicates the greater value of learning in working life nurtured in teachers within the system. It emphasizes the need for teachers to have professional growth support and motivation provided in order to assure effectiveness in the work effort during the instructional period. School authorities and educational institutions need to consider designing development activities that are convenient and interesting to the participants while showing the need for lifelong learning to close this gap. In this manner they can help educators to maintain a certain level of competence and be informed of the recent developments and best practices in gifted education.

According to the survey findings, from the group of teachers studied in the research study, Teachers tend to view themselves as skilled and capable when it comes to teaching gifted and talented students on the whole. Specifically. They feel confident in their ability to identify gifted and talented students (rated at 3 out of 5). They also feel adept, in utilizing teaching methods tailored for these students (scored at 3 out of 5). Beyond this, they actively pursue development opportunities linked to teaching talented students (rated at 3 out of 5). This indicates their dedication to learning and enhancement. Teachers also feel confident in their ability to teach gifted and talented students effectively (3.83) and in their qualifications and ability to teach these students (3.72), though this confidence is slightly lower than in specific skills and knowledge areas. They report being capable of developing learning materials for gifted and talented students (3.97) and adapting the curriculum to meet their needs (3.84), highlighting their practical skills in curriculum development and adaptation. Furthermore, teachers indicate effective collaboration with other teachers, particularly new teachers, to support the needs of gifted and talented students (3.87). This suggests a supportive teaching environment where knowledge and strategies are shared. They also feel proficient in integrating technology into their teaching to enhance the learning experiences of gifted and talented students (4.09), reflecting an ability to utilize modern tools and resources in their instruction. Overall, these results demonstrate that while teachers are generally confident and proactive in their roles, they still see room for improvement in their overall qualifications and ability, and in collaboration efforts. Engaging in growth, professional development and accessing extra support could boost their ability and self-assurance, in educating gifted and talented students.

The results of the t test revealed that there were no variations, in the responses between genders, as indicated by a t value of 2.227 and a significance level above 0.05. This suggests that both male and female educators share viewpoints on their teaching abilities, with gifted and talented students and the efficacy of implemented programs. Similarly, the responses of gifted students did not show statistically significant differences, with a t-value of 1.126 and a significance level exceeding 0.05 for the full dimensions, suggesting consistent perspectives among gifted students as well. However, the ANOVA results indicated statistically significant differences at the 0.01 significance level in the responses related to teachers' perspectives of their competency and the effectiveness of applied programs based on educational level. To pinpoint the sources and trends of these

differences, the Scheffe test for post-hoc comparisons was utilized, revealing that these differences favored math teachers with a master's degree. This suggests that higher educational attainment among teachers is associated with more positive perspectives of their ability to teach gifted students and the effectiveness of gifted education programs. Conversely, no statistically significant differences were found based on teaching experience, as the significance level was greater than 0.05. This implies that teachers' perspectives do not significantly vary with the length of their teaching experience, indicating that factors other than experience, such as educational level, play a more crucial role in shaping these perspectives. To sum up, while factors like a teacher's gender and years of experience do not affect their perception of their competence and the effectiveness of programs designated for gifted students, educational level does, with more favorable perspectives coming from teachers with master's degrees. This emphasizes the value of having higher educational qualifications as additional reinforcing factors for teachers' perceived confidence and effectiveness in gifted education.

The findings from this study align with prior literature in some parts of the field. To begin with, the lack of differences in opinions as per gender is supportive of the findings made by Smedsrud et al., (2022) as well as Jarrah and Almarashdi (2019). These authors also observed that male and female teachers seem to have a common viewpoint regarding their effectiveness in educating the gifted and talented learners. This means that within this area, gender does not appear to be a determining factor with regard to the viewpoints of the teachers, and such uniformity is observed across different genders as far as attitudes toward education for the gifted is concerned. Furthermore, the findings to the absence of substantial differences as a result of teaching experience is in agreement with Allodi and Rydelius (2008) who found that there were no significant differences in the teachers' perceptions of their ability to competently teach gifted students and the effectiveness of gifted teaching programs with regard to years of teaching experience. This suggests that enduring professional experience, in and of itself, does not enrich educators' appraisal of their competencies in gifted education. Hossain et al. corroborate the findings of the current study regarding the effect of the level of education attained by teachers on their perceptions as having a more advanced educational level significantly alters these attitudes.

Like with Wang & Yang (2020) and Yang & Chen (2022), teachers' mastery of educating the gifted and the effectiveness of delivery is directly proportional to their level of education because their qualifications positively impact the perception. This ascertains that there is an optimistic perspective regarding teachers' training because there is advanced educational pedagogical training because master's degree holders tend to see gifted program implementation and students less with their specialized tools and knowledge and see more with their evaluation skills and see competency in the multiple program effectiveness assessment that is done in gifted students as mastery of program evaluation competent implementation evaluation program evaluation of applied merit frameworks. Instruction for the gifted implies the need for more training evaluation for its implementation. Fernandez (2022) points out that the teachers enhanced skills and methods developed through advanced academic study qualify them to sustain educated perception with evidence using their qualifications. Further, better academic training enables teachers to give support multifaceted approaches reasoning tailored fortified gifted learner's intelligent development. Specialized training alongside advanced qualifications to facilitate sharpened

perception dynamic education focused improvement thinking enable problem solving sharpened teachers multi-level sharpened development enhance facilitate diversified shaped challenge sharpened scope reasoning with enhance empirical strengthen, evidence being armed specialization aid enhanced perception gifted multi-level programs becomes vital problem enable employing sought intervention evaluation on viewpoints reason enable advanced gifted program paradigm multi-level child evaluation specialization framework makes advanced sculpted multi-level paradigm assist record enabling portrait multi advanced pose evaluation sculpt multi enabled framework sculpts master enable requiring advanced sculpted pose merit advanced evaluation enabled multi program mastery enable merit sculpted pose sculpt framework enable sculpted multi program enable sculpt enabled child sculpt enable master enable sculpt pose enable advanced sculpt framed advanced pose sculpt enable advanced frame enable program sculpt enhanced child enable sculpted advanced multi sculpt pose advanced enable pose enable advanced sculpt enable enabled program enable sculpt advanced serve sculpt advanced enable advanced sculpt derive aided enable posed enabled framed sculpted sculpt enable mark sculpt frame enable sculpted enhance mark sculpt sculpted enable evaluation frame sculpt enhanced enabled enable sculpt disable enabled multi challenge enable sculpt enable sculpt enable.

The findings from the analysis make clear how the teachers' level of education and their experiences affect their perceptions regarding the teaching of gifted and talented learners as well as the effectiveness of educational programs designed for these learners. The correlation coefficient between Teachers' Perceptions of Their Competence in Teaching Gifted Students stands at 0.47, which suggests a connection, albeit weak, with accuracy predicting this particular variable 21.6 times out of 100. In the same way, the correlation coefficient for Teachers' Perspectives of the Effectiveness of Applied Programs for Gifted and Talented Students is 0.38 with an accuracy of 14.4%. These results imply that progressively higher levels of schooling attained by the teachers correlate with increasingly favorable perceptions regarding their competencies and the effectiveness of programs designed for the gifted learners. As indicated by ANOVA test values 27.208 and 16.521, each with a significance level of .000, the appropriateness of the regression line is confirmed by the ANOVA test results, which demonstrated that the regression model is indeed appropriate for the data. This strengthens the proposition regarding the existing relationship between educational level and the perception of the teachers.

The prediction equations also show this link. In the first dimension, the equation educational level= 3.055 + 0.091 X indicates that higher educational levels positively correlate with perceptions of competency in teaching gifted students. The standard value of 0.120X gives a more precise meaning from the perspective of the Z-score. In the same way, for the second dimension, the equation educational level= 3.121 + 0.104X illustrates that higher educational levels relate to more positive attitudes towards the effectiveness of the applied programs with a standard value of 0.131X. These results support other studies which have noted the significance of higher educational qualifications for teachers towards their perceptions and functionalities in gifted education. Fernandez (2022) and Hossain et al. (2020), for example, noted that advanced academic training provided to teachers improves their skills and knowledge which enhances their

confidence, as well as perspectives regarding their ability to teach gifted students. Similarly, Yang and Chen (2022) reported that educators with advanced educational qualifications tend to have more favorable opinions on the effectiveness of the gifted programs for students.

Moreover, the absence of significant differences concerning gender and teaching experience that this study found aligns with research done by Smedsrud et al. (2022) and Allodi & Rydelius (2008) who highlight that these issues do not markedly affect teachers' perceptions of their competencies or the effectiveness of gifted programs. This consistency illustrates the importance of education as a contributor to fostering a constructive perception and indicates the lack of professional development and high-level training that needs to be done to help these professionals in gifted education. Overall, the findings of this study suggest that increasing the educational level of the teachers improves their perception regarding their abilities to teach gifted students and the effectiveness of gifted education programs. These results corroborate earlier studies concerning the need to have enhanced educational credentials and sustained professional training towards the attainment of an enhanced quality of gifted education.

Conclusion and Recommendations

This research has enhanced understanding related to aspects of the perspectives of teachers on gifted education in terms of their competencies regarding teaching gifted students and the effectiveness of the concerned programs. These findings reinforce the fact that the level of education attained by teachers critically shapes their perspectives. Specifically, higher educational qualifications were consistently associated with more positive views regarding both their own competency in teaching gifted students and the effectiveness of educational programs tailored for gifted and talented individuals. The results also revealed that while gender and teaching experience did not significantly impact teachers' perspectives in this study, educational level emerged as a crucial factor. The regression analyses and correlation coefficients highlighted robust relationships, indicating that as educational levels increase, teachers tend to perceive themselves as more competent in teaching gifted students and view applied programs more positively.

After examining the results of the study and drawing conclusions from them we can suggest a couple of ways to improve education programs further; 1) Prioritize Teacher Development; It's essential for schools to invest in development opportunities, for educators especially in areas that specifically cater to gifted students. This could involve organizing workshops, seminars and collaborative learning sessions to empower teachers and boost their expertise. 2) Adjust Curriculum and Embrace Technology; Efforts should be made to tailor the curriculum to better suit the needs of learners. Blending technology within teaching practices can enhance the engagement and learning outcomes of gifted students as well. Accommodating the learning preferences of technologically inclined gifted students using specific teaching methods can greatly improve learning outcomes. Encouraging educators to seek degrees and specialized certifications in education enhances their expertise and professional development greatly. This can be achieved through providing education scholarships, grants, and rewards. Educational policy frameworks need to actively support the training and credentialing of teachers who work with gifted learners. In this case, the institutions have the means to provide supportive frameworks and designate resources for sustained improvement. Advocating for educators and combining policies advanced

education practices by collaborating on research, sharing practices, and integrating insights to better support gifted students in unison. Foster cross-discipline partnerships between researchers and policy makers to transform gifted learners' programs and gather teachers' perspectives and insights on program effectiveness. Adapting educational practices can be achieved through feedback about the effectiveness of assistance offered to gifted students.

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