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High Abilities or Giftedness in Integrated High-School Education: Perceptions of Mathematics Teachers

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ABSTRACT

Background: The identification of the first ability or gifted students at the Federal Institute Sul-Rio-Grandense (IFSul), Campus Sapucaia do Sul, raised the need to analyse the mathematics teachers' perceptions of the subject in the institute, intending to professionalise the attention offered to these students. **Objectives**: This article sought to present and reflect on how seven mathematics teachers of the integrated high school understand high abilities or giftedness. **Design**: Qualitative approach, participant observation, and interpretive and descriptive data analysis. **Setting and participants**: This study is part of a doctoral research involving seven mathematics teachers who work in regular classes at a Federal Institute in the metropolitan region of Porto Alegre. **Data collection and analysis**: The data were collected through a semi-structured interview, and their analysis was inspired by the descriptive-interpretive analysis. **Results**: Although lacking theoretical depth, mathematics teachers' perceptions of the concept and characteristics of high abilities or giftedness are close to the theories presented and the current legislation. **Conclusions**: It is necessary to professionalise the processes of identification and assistance to high-ability/gifted students on campus, which is foreseen in a research project through continuing education.

Key words: High abilities; giftedness; Mathematics; Integrated high school.

Altas habilidades ou superdotação no ensino médio integrado: percepções de professores de matemática

RESUMO

Contexto: Com o surgimento dos primeiros estudantes identificados com altas habilidades ou superdotação no Instituto Federal Sul-Rio-Grandense (IFSul) – Campus Sapucaia do Sul, surge a necessidade de analisar as percepções dos professores de

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Matemática da instituição sobre o assunto, com vistas à profissionalização do atendimento desses estudantes. **Objetivos**: O presente artigo buscou apresentar e refletir sobre as percepções de sete professores de Matemática do Ensino Médio Integrado sobre o tema das Altas Habilidades ou Superdotação. **Design**: Abordagem qualitativa, de observação participante e com análise descritiva interpretativa dos dados obtidos. **Ambiente e participantes**: O recorte apresentado da pesquisa de doutorado envolveu sete professores de Matemática que atuam na sala regular de um Instituto Federal da região metropolitana de Porto Alegre. **Coleta e análise de dados**: A coleta de dados foi realizada por meio de entrevista semiestruturada, cuja análise de dados foi inspirada na Análise Descritiva Interpretativa. **Resultados**: As percepções dos professores de Matemática sobre o conceito e as características de Altas Habilidades ou Superdotação (AH/SD) se aproximam das teorias apresentadas e da legislação vigente, embora ainda careçam de aprofundamento teórico. **Conclusões**: Faz-se necessária a profissionalização dos processos de identificação e atendimento a estudantes AH/SD no campus, a qual encontra-se prevista em projeto de pesquisa por meio de formação continuada.

Palavras-chave: Altas Habilidades; Superdotação; Matemática; Ensino Médio Integrado.

INTRODUCTION

According to data from the 2021 Basic Education School Census, we have about 1.89 million students enrolled in vocational high school. Of this total, 726,991 are enrolled in integrated high school. Knowing that the World Health Organization assigns the percentage of 3.5% to 5% of students with HA/G and that nationally identified, at all levels of basic education, we have about 24,000 students. Therefore, it is urgent to think about strategies for screening the HA/G population in the school context and ways to professionalise their assistance (Brazil, 2022; Matos & Maciel, 2016).

This article addresses a part of the doctoral thesis (in progress) called "Escutas e anseios sobre altas habilidades ou superdotação no ensino médio integrado no processo de formação continuada" [Listening and expectations about high abilities or giftedness in integrated high school in the continuing education process],[1] from the Graduate Program in Science and Mathematics Teaching at Ulbra. This thesis aims to investigate processes that can implement the national policy for special education (National Policy for Special Education - PNEE) for students with high abilities or giftedness at IFSul – Campus Sapucaia do Sul. Given this context, the article presents perceptions of

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integrated high school mathematics teachers on high abilities or giftedness, as well as reflections and relationships with the theories presented.

HIGH ABILITIES OR GIFTEDNESS: LEGAL AND THEORETICAL ASPECTS

In general, news on TV news or television programmes about people with high abilities or giftedness presents: "Eleven-year-old boy finished mathematics university" or "Three-year-old girl can read and write already". While there are cases like this, they are not even close to representing the totality of people with high abilities or giftedness. Media of this type end up stereotyping and creating myths about the area of HA/G, making it difficult to identify and care for them correctly. (Pérez, 2012)

Therefore, it is necessary to understand the concept adopted by Brazilian legislation to characterise people with high abilities or giftedness. In table 1, we have the definitions of the special education educational policies for special education (PNEE) of 2008 and 2020 and the definition of resolution n. 4, of October 2, 2009, which establishes the operational guidelines for the Specialized Educational Assistance in Basic Education.

Regarding the definitions in Table 1, it can be said that they are relevant because: (1) They are not limited to a purely academic perception of HA/G; (2) They focus on the plurality of areas of human knowledge in which a person can excel; (3) They understand HA/G not only as performance but also as the potential to demonstrate remarkable performance. Still, a change in the PNEE from 2008 to 2020 can be seen in terms of involvement with the task: in the first, with areas of their interest, while in the second, with school activities. (Virgolim, 2019)

Besides those definitions, Resolution CNE/CEB n. 2, of September 11, 2001, in article 5, defines that "students with high abilities/giftedness are those who present great learning facilities that lead them to master concepts, procedures, and attitudes quickly" (Brasil, 2001, p. 2). Importantly, this definition highlights two characteristics of giftedness: speed of learning and ease with which such students engage in their areas of interest. (Virgolim, 2007)

Table 1

Definitions of students with high abilities or giftedness (Brasil, 2008; 2009; 2020)

Document	Definition of high abilities or giftedness
PNEE 2008	"Students with high abilities/giftedness show high potential in any of the following areas, singly or in combination: intellectual, academic, leadership, psychomotricity, and the arts. They also show high creativity, great involvement in learning and performing tasks that interest them." (Brasil, 2008, p. 15)
PNEE 2020 (suspended)	"Students with high abilities or giftedness who show high development or potential in any area of domain, isolated or combined, creativity and involvement with school activities." (Brasil, 2020, Art. 5º III).
Res. 4/2009	"Students with high abilities/giftedness: those who present a high potential and great involvement with the areas of human knowledge, isolated or combined: intellectual, leadership, psychomotor, arts, and creativity." (Brasil, 2009, Art. 4º III)

The definitions in Table 1 show us that the way people see high-ability or gifted individuals is much broader than what can be observed in the media in general. It results from contemporary, multimodular conceptions of intelligence, based on authors such as Howard Gardner, as opposed to an old view of intelligence —unimodular, psychometric, and based solely on IQ (intellectual quotient) tests. The definitions are also anchored in Joseph Renzulli's three-ring conception of giftedness, which we will cover shortly.

Exploring a little the question of intelligence, Howard Gardner, from Harvard University, developed the theory of multiple intelligences, widely accepted among Brazilian researchers and educators for focusing on human potential and for its practical application in schools. Such a theory conceives high abilities/giftedness as potentials and abilities in specific domains rather than a general ability of all domains. This theory establishes that intelligence can be described by a set of nine (or more) skills, namely: linguistic, logical-mathematical, spatial, musical, bodily-kinaesthetic, interpersonal,

intrapersonal, naturalistic, and existential. The last one is still in testing (Virgolim, 2019; Gardner, 1995).

In turn, Joseph Renzulli, from the University of Connecticut, is one of the main references in the area of high abilities/giftedness. It is the theoretical reference adopted by the Brazilian Ministry of Education (MEC) for the HA/G resource rooms in the country. Given the heterogeneity of people with HA/G, the author proposes the distinction of high abilities/giftedness into two major categories of superior abilities: school giftedness and creative-productive giftedness (Renzulli, 2018; Virgolim, 2019).

According to Renzulli (2018, p.22), school giftedness refers to "students who are good learners of lessons in traditional school performance". Creative-productive giftedness refers to "the traits that inventors, designers, authors, artists, and others apply to specific areas of economic, cultural, and social capital" (Renzulli, 2018, p.22-23).

The leading theory about high abilities/giftedness, recognised nationally and internationally, is Renzulli's three-ring theory. According to Virgolim (2019, p.116), this theory "deals with the theoretical and philosophical aspects of giftedness and tries to answer the question: Who are the gifted ones?". According to the author's studies, the vast majority of people that are famous for their accomplishments were found to have three sets of well-defined traits: above-average ability, task involvement, and creativity. Figure 1 shows the graphic representation of his theory (Renzulli, 2018; Virgolim, 2019).

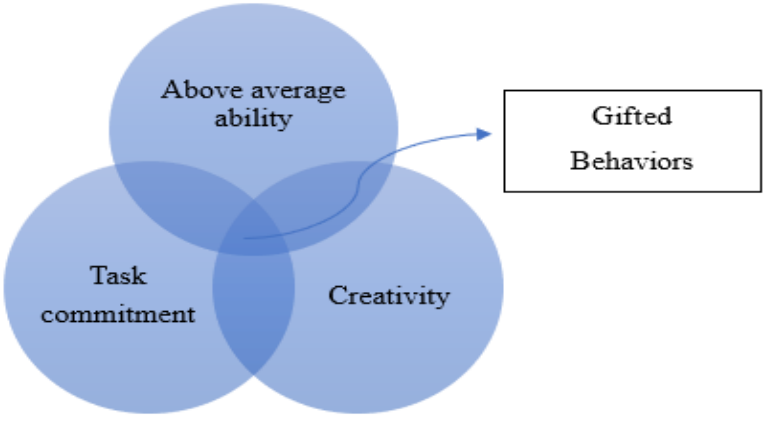
The above-average ability ring is considered the most constant in HA/G students and refers to general and specific skills. For above-average general skills, "high levels of abstract thinking, verbal and numerical reasoning, spatial relationships, memory, and word fluidity" are considered. Also within the above-average general skills are "the adaptation and conformation of new situations found in the external environment", as well as "the automation of information processing", i.e., "the rapid, accurate, and selective retrieval of information". Above-average specific skills are "the application of various combinations of the above general skills, applied to one or more of the specific areas of knowledge or areas of human performance", such as "the arts, leadership, administration" (Renzulli, Reis & Tourón, 2021, p.46).

Although less constant, the ring that refers to the involvement with the task is quite present in areas of student interest. Task involvement is defined as "the ability to demonstrate high levels of interest, enthusiasm, fascination, and

involvement in a particular problem, area of study, or form of human expression". Within the commitment to the task, also, we have the "ability to demonstrate perseverance, tenacity, determination, effort, and dedicated practice", as well as the presence of "confidence in oneself, a strong self-esteem and the conviction about one's ability to perform an important job" (Renzulli, Reis & Tourón, 2021, p.46).

Figure 1

Renzulli's Three-Ring Theory (Adapted from Renzulli, 2014, p. 544)



Although not a constant in HA/G students, the creativity ring is usually present or can be worked on in areas that interest the student. Creativity means "fluidity, flexibility, and originality of thought"; one can observe that the student is "open to experiences, receptive to what is new and different in thoughts, actions, and products of their own or others". It is that individual who is "curious, speculative, daring, and mentally playful", as well as "willing to take risks in thoughts and actions, even to the point of being unrestrained". It is the student who is "sensitive to the details, aesthetics characteristics of ideas and objects" and "willing to respond and react to external stimuli and to their own ideas and feelings" (Renzulli, Reis & Tourón, 2021, p.46).

Another essential part of Renzulli's theory deals with the *school enrichment model* (SEM), which aims to offer children and young people in the school environment as many opportunities as possible with a view to self-fulfilment.

Regarding the types of enrichment, we can say that type I enrichment includes general and exploratory activities that expose students to a diversity of problems, ideas, questions, theories, skills, lectures, field trips, visits, interviews, in other words, possibilities. Type I knowledge triggers the individual's internal curiosity and motivation and can serve as an external stimulus for students to find their purpose. According to Renzulli, Reis, and Tourón (2021), such activities must be available to all students at the school. In short, type I enrichment was designed to stimulate new interests and lead students to deepen their interests through types II and III enrichments. (Renzulli, Reis & Tourón, 2021)

Type II enrichment is about individual and group training and research activities in a wide range of cognitive, metacognitive, methodological, and affective skills. This type of enrichment prepares students for creating tangible products or building solutions to real-life problems, with an emphasis on skill development and the summing up of necessary information. The authors emphasise that curiosity alone is not enough to move towards action; to make decisions, it is also necessary to be properly equipped to take advantage of and use all resources. It is worth noting that while type I activities were aimed at capturing the students' interest, type II activities are aimed at teaching students the paths and possibilities of how to move from inspiration to action. In summary, type II activities are subdivided into five categories: (1) cognitive training; (2) affective training; (3) training in learning about learning; (4) investigation and referral procedures; (5) Written, oral, and visual communication (Renzulli, Reis & Tourón, 2021).

Type III enrichment, on the other hand, addresses individual or small-group investigations of real-world problems. Those investigations encompass acquiring deep-level understandings, developing authentic products, developing self-directed learning skills (in aspects such as planning, decision-making, and self-assessment, for example), and developing commitment to the task to the point of feeling fulfilled and interacting effectively with the other students. By real-world problems, we mean those that mean a personal frame of reference for students and that do not have an existing or unique solution.

METHODOLOGY

The research presented is qualitative and aims to investigate the impressions of the surveyed teachers on the subject of high abilities/giftedness. It is an excerpt from a doctoral research, whose general objective is to

investigate processes that can implement the National Policy for Special Education (PNEE) for students with high abilities or giftedness at IFSul – Campus Sapucaia do Sul.

Regarding the procedures, it is characterised as participatory research. According to Marconi and Lakatos (2002, p. 90), participant observation "consists of the researcher's real participation with the community or group". This choice for participant observation occurs for several reasons. Among them are: (1) Increase the knowledge and understanding of the researched group on high abilities/giftedness, in view of the little knowledge or erasure of the theme in school environments in general; (2) Work on the theme collectively, listening to the concerns arising from the teachers of the Federal Institute under analysis; (3) Promote the inclusion of students with high abilities/giftedness. This choice is also due to the natural participation of the TSS researcher as a faculty member of the campus.

As for the data analysis, the interpretive descriptive analysis inspired by Rosenthal (2014) is used. The interpretive descriptive analysis provides the investigation of the new and the unknown, the apprehension of the subjectively intended meaning and the reconstruction of the latent meaning, the description of actions and social contexts, the reconstruction of the complexity of action structures from the particular case, the verification of hypotheses and theories starting from the particular case, and the empirically based development of hypotheses and theories (Rosenthal, 2014).

MATHEMATICS TEACHERS' INSIGHTS ABOUT HIGH ABILITIES OR GIFTEDNESS

The Instituto Federal Sul-Rio-Grandense – Campus Sapucaia do Sul is located in the metropolitan region of Porto Alegre, 35 km from the capital of Rio Grande do Sul and has about 1,450 students enrolled. In this context, Law n. 13.409 of 12/28/2016, which came in force in 2018, guaranteed vacancies for people with disabilities in high school technical courses of federal educational institutions, and the first cases of students with high abilities began to be identified, although they are not the target audience of this legislation. The doctoral research then arises from the curiosity and anguish of the researchers in this article on how to serve better this part of the population that is often made invisible and is often stereotyped through myths (Pérez, 2012).

Thus, one of the research stages is: interviewing mathematics teachers, to analyse their perceptions/insights, interests, and demands on the subject. To this end, a semi-structured interview was prepared, consisting of five questions:

1) For you, what a person with high abilities/giftedness (HA/G) is?
2) Do you know someone with HA/G, or have you had students with HA/G in your classroom? If your answer is yes, what characteristics of that person caught your attention/perception? If your answer was no, what characteristics would you analyse for a likely indication for the HA/G identification process?
3) What types of strategies would you adopt when knowing that there is a gifted/high-ability student in your classroom?
4) What would you like to learn about high abilities/giftedness? Would you participate in a virtual course on the subject?
5) Comments, doubts, and/or suggestions on the subject.

Before starting to analyse the answers, we must say that the campus has, in the year 2022, eight mathematics teachers, seven of whom accepted to participate in the interview. Due to the pandemic period, all interviews were conducted by video conference, recorded, and transcribed. To preserve the identity of the teachers interviewed, we will call them M1 through M7.

Considering how teachers understand the concept of a person with high abilities/giftedness, M1, M4, M5, M6, and M7 pointed out an ability (well) above average. In their words:

> M1: "It's the famous intelligent [person]. It is that person who has... a... a behaviour, an area of knowledge, a higher ability, well above average, above the best considered, right."
>
> M4: "Person with above-average ability in some area of their development, whether intellectual, artistic, or sporting expressions, but above-average ability."
>
> M5: "I think they must have more or less the same characteristic, that... that will lead to some of the areas, but it is some... some differentiated skill in relation to an average, right? [...] But I have the impression that with the relationship with mathematics, a high ability, this differentiation [...] would have to be a really big difference."

> M6: "I imagine that I would define a student with high abilities or giftedness as a student with a performance above the average, above the performance I already have from my students in mathematics, right?"
>
> M7: "I think high ability is a term that should at least be incorporated into the educational field for anyone who has any specific talent that is generally above average, considerably above average."

Although teachers M1, M4, M5, M6, and M7 have based their answers on their experiences and/or common sense, there is an approximation with Renzulli's theory of the three rings (2018), which defines gifted behaviours as the interplay of three distinct characteristics: above-average ability, task commitment, and creativity.

M2, on the other hand, points out issues of ease and speed in learning. According to M2,

> M2: "A person who could learn very easily, right? [...] Who could solve activities quickly and correctly, in a flash..."

M2's answer is in line with one of the definitions present in Brazilian legislation for high abilities/giftedness; more specifically, Resolution n. 2, of September 11, 2001, which defines that "students with high abilities/giftedness are those who learn very easily, which leads them to master concepts, procedures, and attitudes quickly".

M3 highlights issues related to student focus and the development of activities far beyond what was requested. According to M3,

> M3: "Having my experience with this type of student, I can see that a high-ability or gifted person is one who manages to focus on a subject and develop it in a way beyond what we expect. He or she can, for example, if we define: 'Let's work from... from point A to point B'... a gifted person can get all the mid terms between A and B and even go beyond that point."

M3's answer has connections with Daniel Goleman's (2006) theory of emotional intelligence, which addresses aspects such as attention and focus. We realised, therefore, that defining the concept of high abilities/giftedness is not so simple. There are several faces of a construct, which demonstrate only a part of it. For example, while Renzulli (2018) defines high abilities or giftedness as the intersection of three characteristics (above-average ability, task

commitment, and creativity), Gagné no longer uses this term. He prefers to use a natural "gift" that occurs early in life, called aptitude/endowment, and another systematically developed "gift", called competence/talent. (Gagné & Guenther, 2010; Gagné, 2021). For Silvermann (1997), giftedness is asynchronous development. The Brazilian definition in the National Policies for Special Education - PNEE (Brasil, 2008; 2020) and in the Guidelines for Specialised Educational Assistance (Brasil, 2009) bring a macro and quite comprehensive definition. Therefore, analysing different definitions is essential to understand the reality of the HA/G student better.

Regarding the question "Do you see any difference between the terms 'high abilities' and 'giftedness'?", teachers M1, M3, and M6 consider that the terms are synonymous, while M2, M4, M5, and M7 analyse the terms as distinct. Such difference, pointed out by teachers M2, M4, M5, and M7, may rely on the fact that high abilities would be defined as an above-average ability, while giftedness would be an extremely above-average ability.

Legally, the LDB[2] does not distinguish between high ability and giftedness, treating them as synonyms. However, there is no consensus in HA/G area, in which several authors treat such terms as synonyms, and many others treat them as different concepts. In practical classroom terms, to a greater or lesser extent, both require specialised educational assistance (§1 and §3 of Art. 58 of the LDB) and an individualised educational plan (item I, Art. 59 of the LDB). In addition, both need a properly trained teaching team to assist them in the regular classroom and the resource room (item I, Art. 59 of the LDB) and at least one education assistance teacher with specialisation in the area (SEA) to organise the educational processes (item III, Art. 59 of the LDB). It is also necessary to analyse the possibility provided for in the acceleration law (Item II of Art. 59 of the LDB). If we think that high abilities or giftedness can be more or less profound, more or fewer interventions will be necessary to adapt the environment to the students' needs. The important thing here is to give visibility to this group, which is so often made invisible or not worthy of attention because they are considered "already intelligent" (Brasil, 1996).

Regarding the questioning about characteristics of people with HA/G that call their attention or traits that can be analysed for an indication of the HA/G identification process, M1 points out aspects related to quick learning,

[2] Lei de Diretrizes e Bases da Educação Nacional [Law of Guidelines and Bases of National Education.

focus on topics of interest, and specific socioaffective characteristics, such as introspection, for example. More specifically,

> M1: "I had students in my mathematics area, he – the guy – was present in the classroom and he was studying other things, reading other texts. He would look at my painting for seconds and instantly learn, in a flash."

In fact, speed appears to be present as a possible indicator to identify a HA/G person, according to one of the Brazilian definitions present in Resolution 2 (Brasil, 2001), as previously mentioned. Focusing on topics of interest is both a characteristic of emotional intelligence, according to Goleman (2006), and one of Renzulli's three rings: task commitment. Regarding introspection, we know that HA/G people are heterogeneous, but introspection appears as a possible trait, especially in academic settings. (Virgolim, 2019)

M2 and M5 share the idea that they have never had gifted students because, according to their thoughts, such a condition is extremely rare and should happen in all disciplines or at least at an extremely high and innovative level of knowledge. They also raise the idea of factors such as creativity, ease, and curiosity as possible indicators in the area. According to M2 and M5:

> M2: "At first I don't remember any student in my class who had this giftedness, I remember very prominent students or a little prominent in relation to the others, okay? There is a student specifically that I had for six months in integrated high school and she... she is very curious, she was very curious and asked questions like that, more in-depth, right? Taking into account more mathematical issues, ok? So, she asked where this came from, right? Why is this so, right? To force me to explain in with a more mathematical rigour, ok? But I also don't know whether that was giftedness, ok? Because I imagine that giftedness is for all subjects, the person would have to do well in all subjects".

> M5: "Because I think that... is... what I think would differentiate... like this: the student who has high ability can learn very easily; the gifted student, he or she manages to create new things from what you said briefly, they manage to advance, and things that you haven't even... you haven't even touched on the subject, they can already do new things with it. In that sense, I don't think I've ever met anyone. [...] But with

> high ability [...] I think I've already met some students, yes; who demonstrate much more ease [...]"

Such considerations agree with an old idea of intelligence, seen in a fixed and unimodular way. They are also similar to the idea of the studies by Terman et al. (1925) on the percentage of gifted individuals, around 1%, which is very low, considering that currently, the WHO indicates something around 3.5% to 5% (Matos & Maciel, 2016), this only considering the HA/G academic population. Gagné (2021) considers the percentage of 10% in their domain of knowledge and considering age pairs, while Renzulli (2014; 2018) considers 10% to 15% of the population of a country.

M3 and M4 indicate as characteristics that called their perception in HA/G students a voracity to learn content, and an above-average ability to the point of surpassing the teacher's knowledge. In the respondents' words,

> M3: "Having that idea of active methodologies in which you give the students the content before, so they can read it in advance, those gifted students that I had in my classroom, they do the pre-reading and even then they still bring many more concepts that overlap their very integrated high school, right? They (over)come... they ask concepts from the university, from higher education, and that puts a lot of pressure on me and scares me because you are not prepared at first."

> M4: "I have had in my career, like this, in class, notably, contact with students who had an excellent performance in the exact sciences... Mathematics specifically [...] well, way above average, so much so that they were better than the teacher, me, in this case; so, notably, so, they were highly skilled at least [...] because the ability is far above average. [...] you cannot compete with the person because their system of thought is different from yours. The thing works as a block, it's not one little thing after another, it's all together, it's a storm at the same time".

Such voracity in learning indicated in M3's and M4's reports can be related to both curiosity and commitment to Renzulli's (2018) task, in the sense of doing and deepening topics of their interest. A "storm" of knowledge and ideas is something very characteristic of creativity, one of the concepts of Renzulli's theory of the three rings (2018).

M6 and M7 point out as characteristics that caught their attention about the HA/G students a remarkable performance in written assessments, such as classroom tests, Olympics, and academic competitions. According to M6 and M7:

> M6: "... it was in a test situation. Funny, right, we end up identifying not so much in class, but when there is a moment to assess, right? [...] it was in a test that I gave to his peers and [...] a good part of the class did not go well and this student's test... it was grade 10, he got 10, and in addition to grade 10 it was a test that I consider very well written, there were no erasures, you realised that the student's ideas, well, it was a very well-placed thing, well, you realise that it was not something, like, he did it by luck [.. .] It's a clean test, so... you look at it like that and you can take the student's test as a template to correct the others".

> M7: "Yes, I've had many students that I would identify with high abilities. [...] Speaking specifically about my area of knowledge, since I had more in the classroom... we, at the school (before IFSul), we worked with many students who were doing international mathematics Olympiads, students who already had a history, right, of competitions. So I think you can say that these students were students with high abilities and, of course, we have academic performance, yes, it is an indicator [...] but not only the academic performance, I had many students who sometimes ... so... I talked to him, I analysed the way they had to solve problems, to form concepts mentally and we could see that they were really differentiated students".

Assessments and tests have always been considered as possible indicators of HA/G. However, such indicators do not necessarily capture all HA/G students and may indicate those who have, according to the Brazilian definition of the PNEE, a remarkable performance. However, they may fail to identify potential and talents that are still latent; they did not emerge yet. Academic achievement tests usually do not indicate factors like leadership and creativity, either. M7 also points out different ways of forming concepts and solving problems in students from a former school, strongly indicating the presence of divergent thinking, a characteristic often found in HA/G students. And, if we stop to reflect a little on our teaching practice in mathematics, it is

likely that we have already come across a student who usually presents completely original solutions to a problem, and we have not even noticed this as a possible indicator for HA/G (Brasil, 2008; 2020; Virgolim, 2019).

Regarding the questioning about the types of strategies that the teacher would adopt when knowing that there is a student with HA/G in the class, M1 and M2 say that they would use aspects related to more difficulty and/or depth in exercises and assessment questions. According to the teachers,

> M1: "I made different assessments and styles for her. During the class I would personally pass an individual exercise. Much more difficult, right, or as they say: challenging; and the evaluations, I regularly evaluated the class and added two, three or more, you know, much more difficult questions..."
>
> M2: "What do I think I could do, that I would do it like this, I would force him more with math exercises, right? And I would try first within the topic that we were working on, then I would gradually put more difficult exercises on that topic. Then, if he responded to that, I would start to expand, expand in a little while not to topics he had not seen yet, but to subjects he had already seen, and to demand more in-depth concepts about those topics. [...] And only after that I would move on content, to content that he hadn't seen yet."

Here it is important to emphasise that more difficult questions only make sense if the student likes them and is interested in dealing with mathematical challenges, which agrees with M1's proposal, for example. HA/G people are a very heterogeneous group, and perhaps not everyone is comfortable with this approach. At this point, it is important to visualise the relevance of an Individualised Educational Plan (PEI), provided for in the LDB (Art. 59), as it will map the learning styles and interests that the student has. On the other hand, M2's speech is concerned with each student's learning stage, which is both a positive and a negative factor. Positive, because the student is expected to reach the pre-defined objectives in each stage. Negative, as it can refrain the student from knowing other topics in case the student is not considered to have delved deeply enough into previous objects of knowledge. (Brasil, 1996; Virgolim, 2019)

Teachers M3, M5, M6, and M7 point to extra-class strategies, in which the student's approach to the teacher becomes closer and the performance of differentiated activities more feasible. As per M3, M5, M6, and M7,

M3: “the strategy that I adopt, right?... when there are students of this type, I continue to give the normal content, but in some aspects, some points of the topic, I bring that something extra that [the HA/G student] is always looking for. [...] I have a group, a teaching project, where we gather to discuss mathematics weekly. So, they choose the theme, right? Before the pandemic, it was set theory and number theory, and this year we would start with the Bayesian inference.”

M5: “It would be an activity that I would like to adopt. Why do I say I wouldn’t adopt it? Because we have to do it, we end up working on the average, we end up attending the average of the students, but what I would like to be able to do is to be able to work a little closer to that student, with more time in the week. I don't really agree with the idea that many have, that good students learn on their own and that we will only get in the way. No! On the contrary, I wish I could have more time to be around that student. [...] To be able to instigate the student to do different things, which we don't... in the classroom, we end up absorbed by the average and can’t do it and after that, when you're out of the classroom, then you end up absorbed by other bureaucratic problems and so on, huh? And then you can't do it either, so I’d like to have it like this, get some time to deal closer with student and be able to give new materials, ask things, questions, maybe more interesting than what we do in classroom, things like that.”

M6: “the big problem is that you work inside the classroom with the large group, because when you prepare a class, let’s say, a very basic class to try to rescue that student who has a lot of difficulties, it’s a demotivating class for most of the coleagues; inside the classroom, you prepare examples that, in this case, would require a more elaborate reasoning of that student, it is also demotivating for most students, because they would not achieve it either. [...] For us to be able to give attention that student (with HA/G) in class, perhaps the ideal would be for us to get a schedule somehow, right? Within the grid or in reverse shift, a time that we can work privately or even in groups with those students, a group, maybe, more outstanding but inside the classroom, I don't know if it's possible, it may be, but the point is that, to capture this student,

> you can't capture a large part of the class; so, somehow, you have to go through a construction to reach that student's level without losing the ones behind as well."
>
> M7: "I always tried to do a different job, parallel to the classroom environment because, well, unfortunately, well, at least in all the schools I worked at until now, we didn't have much space to do that in the common curriculum, mainly due to the assessments; it's that mentality: that everyone must take the same class and do the same tasks, and everyone will have to take the same exam, so I've always tried to do this side work. When I worked in the Mathematics Olympiads, I could do it, and at school (previously), in general, participation in the Olympics was voluntary. [...] In (classes for) the Olympics, then we had all the freedom to work in an ideal world! [...] be able to choose the work I would do with my students. And so, within the preparations for the Olympiads, I always tried to bring not only the issues of the Olympiads, but general topics, like, of mathematics, that we could discuss..."

It is interesting to observe the difficulty that M5, M6, and M7 bring about working with a HA/G student in the regular classroom. As the classroom often ends up homogenising students, how can they be differentiated in order to serve everyone inclusively? Is it possible to have a simple answer to such a question? The fact that materialises here is that specialised educational assistance in a resource room or other environment (laboratories, libraries, among others) in reverse shifts is essential for the general education of that HA/G student to be complete. In fact, there are several services available to these students: compression, acceleration, enrichment. It is important to be aware of all possibilities according to the student profile. Such service is also provided for in the LDB, Art. 58. It is important to emphasise that M3 already uses type II curriculum enrichment through projects, according to the students' interest. When working in the area of interest, commitment and perseverance usually appear in HA/G students. (Brasil, 1996; Renzulli, Reis & Tourón, 2021; Virgolim, 2019)

Teacher M4, on the other hand, merges elements previously analysed, i.e., he would use more difficult questions in assessments and would also use extracurricular activities to deepen topics of interest to students. He brings something different from his peers, making different materials with a view to

building the student's autonomy. He considers that his actions are still not enough to provide care to the HA/G student. In his words,

> M4: "I think there should be a more powerful strategy than the ones I adopt. But, in relation to the exact tests, which is where I can do some... some interference, when I do the tests and although it takes more work and you are, sometimes, you don't do it because you will consume more energy, different tests can be made for people with high abilities or giftedness. Different material can be produced to encourage them to walk more independently in other, in other mathematics topics, with even more depth, different subjects, so... I had students... students who studied mathematics in high school, but I proposed that they studied calculus. And they did very well in calculus. They understood derivatives, integrals, and wanted to ask questions, and I in a flash started giving them tasks to answer. So, objectively answering your question, it is in the classroom, it is to propose more demanding assessments and forwarding of content for them to study independently and that is not much."

Regarding the questioning about what they would like to learn about high abilities/giftedness, teachers M1, M2, M6, and M7 point out issues related to the identification of a HA/G student, i.e., from knowing the definition of high abilities/ giftedness, passing through indicators of a HA/G student in the classroom and whether there is a difference between HA and G.

> M1: "I would like to know, so, ah... what... [...] what are the objective criteria, right, that define a gifted person and if it is a synonym with high abilities..."

> M2: "How to identify it like this, and identify it early, how to identify a student like this as soon as possible, right?"

> M6: "The first thing is the definition, because if we have the definition, we know how to differentiate the situation when it happens in front of us [...] It's important to know the definition, right? ... of giftedness and high abilities and if there is a difference between one and the other and which one is the one."

> M7: “I really want to learn about what this concept is. Whether there are scientific bases to define whether a person is or is not gifted. [...] What does science say about giftedness? So... is it a phenomenon? To what extent is it verifiable or whether there is much, much... how shall I say... a lot of value judgment on the part of society, right?”

There is a clear concern with the concept here, considering that it is from it that you can have a look of perception and search inside the classroom. Knowing that one definition will never suffice, it is important to provide, in continuing education, a wide range of definitions from different authors and several pedagogical instruments for screening HA/G people to sharpen the look of this teaching team to combat their invisibility.

Teachers M2, M3, M5, and M6, on the other hand, indicate issues related to the care of HA/G students. From “most appropriate” strategies for care, covering aspects of student development and how their learning takes place, to how to work and differentiate objects of knowledge within the regular classroom. More specifically,

> M2: “...and I would really like to know more appropriate strategies, like that, right? [...] that did not discourage, but on the contrary, right? Because you must encourage this student because what I heard was also the following: 'suddenly, you have a gifted student, what happens? They are always ahead of the class. And then the teacher does not follow them in a different way, right? So, the person becomes indiferent because he/she already knows that, so they doesn’t need that class, they won’t pay attention. He needs, in fact, a differentiated service, as they say, the opposite, right? ... (as well as) people with special needs need differentiated care, these cases of giftedness and high abilities also need differentiated care, so that they advance within what they can advance, right? So I wanted to know strategies that have already been applied, related concepts that have already been studied, that have already been tested.”

> M3: “Well, my great interest in this subject is trying to see how the student's development takes place, not just mine, right? It is studying in a large group, the ideas of behaviour. [...] I think it's more, it wouldn't even be about teaching-learning, but from

> the psychological point of view of the students, how it works..."
>
> M5: "I think the first thing I would like to learn is whether there is a difference between the two. If there is a difference between these two concepts there, right? [...] but after knowing if there is a difference, it doesn't matter if it's the same thing, see what other strategies [...], right? [...] there must be other strategies of which I am not aware of what I could do for them [...] something I could do even during that turmoil that we have in the classroom, there."
>
> M6: "... I would like to see, maybe, techniques or... I don't know... maybe ways to organise the class to reach a student who is gifted in class..."

It is important to understand here how identification and attendance are intertwined. In this perspective, we ask: Why should we identify HA/G students if not to meet their specific needs? Identification cannot and should not occur without purpose. We identify [a HA/G student] to include them so that they do not feel on the sidelines of the school process. In this sense, we observe here a concern of the teaching staff with this service. Part of this concern is justified by the lack of knowledge: how will I serve a student I do not know about? In this line, we understand that the teacher wants to know the HA/G concept. It is a start. Once the concept and ways of tracking students in the classroom are understood, it is time to welcome them in their particularities. So, it is time for the service. Therefore, teachers already indicate here that in-class and extra-class care strategies are fundamental elements for the continuing education that is planned to be carried out and that will certainly be present.

M4 shows the desire to deepen knowledge about IQ tests and the different types of intelligence and indicates his will to know how to identify such intelligence in his students. More specifically,

> M4: "I wanted to learn more about IQ tests; there are some IQ tests on the internet that I don't think are reliable. I think that the IQ test has to be done by a multidisciplinary team, but I wanted to understand more how the IQ test is produced, in relation to academic ability, right? But I would like, this is a curiosity that I have, like this... but I would like to know in more detail all types of intelligence and how we can perceive

> this kinesthetic, bodily, artistic intelligence, all the types that, if I don't remember, are seven or eight."

This passage reveals the teacher's desire for a theoretical deepening in the HA/G area. The teacher's speech refers to Gardner's theory of multiple intelligences (1995), in which the author understands intelligence as focused on human potentials and subdivides it into nine types (or more), namely: (1) Linguistics; (2) Logical-mathematical; (3) Spatial; (4) Musical; (5) Bodily-kinaesthetic; (6) Interpersonal; (7) Intrapersonal, (8) Naturalistic, and (9) Existential. The last intelligence is still in the study phase.

Still considering the questioning about how teachers would like to learn about HA/G, all of them report characteristics that are present in continuing education courses: theoretical, legal, and practical aspects. Specifically, M1, M2, and M6 state that they would like good training in which they could put their knowledge of the area into practice, including promoting the acceleration of the institution's students in this course and meeting teachers who work with those students. In the words of M1, M2, and M6:

> M1: "... I would like this part to be like this in training, perhaps in teacher continuing education so that we could understand how legislation rules and make, promote (the acceleration of) one or more cases at school, because, look: in the 11 years that I complete now in May here at this school, I have never seen a student be accelerated in three years[3] for giftedness."

> M2: "A good education... I think (that) the ideal for me would be to accompany a teacher who has already worked with this and who has this knowledge, who is working with a student. [...] I think a lecture, it would work well for me. But what I would like to see in this lecture, you know? I thought that right now, you show me, ok? A video... of a teacher working with a student, with practical examples of what he/she did, right? What the student did, ok? Then you show the video, and this student, he/she had such a performance, the teacher did this, this and this, ok? And then in a little while, you come and comment, you comment on that fact, ok? The teacher used this technique and this is based on this study, the student acts so, so

[3]The technical (daytime) courses integrated to high school at the campus last four years. Thus, "being accelerated in three years" refers to accelerating the student so that he/she completes the integrated high school in three years.

> and so. Then in a little while you do this with two, three students, right? [...] it won't necessarily be the same technique all the time, but if it were, I'm imagining there's a pattern, you know?"
>
> M6: "I think that one of the ways would be to listen to the student, which was the case of this '*live*' of yours, I found it very productive, you know? Another one, maybe we, maybe talking as an area, maybe... there, the mathematics colleagues, in principle, as an area, trying to understand how we could work with this student profile. [...] I would prefer if we had face-to-face meetings with the lecturers, it could be a roundtable, maybe, to talk about it, but it would have to be for me the basics of the basics that I don't know anything about high abilities."

It is important to emphasise M1's intention to "see in practice" a case of acceleration. It is known in the literature that acceleration is a process provided for in the LDB and that it has multiprofessional assessment, but it is very difficult to occur on a daily basis. In general, the lack of acceleration is justified by the lack of emotional maturity of the student. Of course, acceleration is not defended here without the due analysis of the professionals involved. However, it is necessary to pay attention to the asynchronism sometimes present in HA/G students, who often are two or three grades ahead in cognitive knowledge, but whose emotional development is according to their age. So, thinking about it, the acceleration may never occur, and that student may get frustrated with school. In this sense, and with a careful evaluation of the team, we understand that such student can be accelerated and that the school provides the emotional support that this student needs.

Teachers M3, M5, and M7 indicate that they would like to learn through case studies and discussions. They report an interest in comparing the literature in the area and teachers' practices in the classroom, and they also want to create a dialogue group on the subject. According to M3, M5, and M7,

> M3: "I think that, for me, it would be a mixture of case analysis, discussion, it would be a seminar of case analysis and demonstration of analysis results, for example: take a group of five teachers who are doing this training and then discuss some cases that are recurrent in literature, that are classics of literature on high abilities."

> M5: “I think that to have training in this area, we have to study a case, we have to have an example to work with and really understand, how it works in a case that is, like this...”
>
> M7: “So I would very much like to discuss this in interdisciplinary groups. I, for example [...] (in) every (time) I ever heard about anything similar to giftedness, it was always in the mathematics teachers' environment. So, if by chance, one day we, at the federal institute, we were to have a discussion group, I would like it to be interdisciplinary, because otherwise it will be biased and that is all I would like to get away from now that I am working in the environment that seems much more welcoming than what we had at the previous school[4], for example."

The statements of M3, M5, and M7 meet the objectives of the thesis that originated this article: to provide continuing education that meets the aspirations of the teaching community. In addition, we can notice the concern of teachers to combine theory and practice in their teaching activities, both in regular classrooms and in an extracurricular regime.

Teachers M4 and M5 indicate they want to learn about HA/G screening indicators, combining theory and practice. They want to be able to apply this knowledge in the search for students who are likely to have HA/G. According to M4 and M5,

> M4: “Well... I already had a school module about high abilities and giftedness, I already know that there are maybe seven intelligences, I think it’s the naturalistic, natural... no... there's a last one there, it was the last one that came in, I never know whether it exists, or whether it's... they're still determining whether it exists, but I’ve had these... this. Then, after it has passed, I say: ‘It’s true, I know that, they exist’... but ok, what do I do (with) this information now? So, identifying people is something that would please, at least having those indicators that could attract attention and turn on a small light for you to be able to... ‘look, there’s a road here, maybe you go there, maybe you do that’...”

[4]Name omitted to protect the interviewee's confidentiality.

> M5: "... I would like something from our area, from mathematics, ok? And to show it, well, learn to identify. 'Look, here I have a... a person with high ability, here is a gifted person, here is someone who is just very interested and stuff."

In M4's speech, we note that identification and care are combined, but it focuses on identification, as it is the teacher's starting point for specialised educational care for this student. Similarly, M5 seeks to differentiate an interested student from a high-ability or gifted student precisely because he understands that it is when the process of recognising this person, their interests, characteristics, and aptitudes begins. According to Gagné (2021), recognising students' aptitudes and their interests and objectives establishes a process of developing such skills in competencies, which is subjected to intrapersonal and environmental catalysts. Thus, identifying/recognising the gifted student goes beyond a mere label. It is the identification of cognitive, emotional, and social needs; it is an analysis of this individual as a human being who has desires, wills, and passions and who learns differently, many times in an easier and faster way. However, they can also have diverse learning styles and thinking that often diverge from the norm. Therefore, it is only with broad recognition of its multiple characteristics that it is possible to attend to a HA/G student entirely.

CONCLUDING REMARKS

This article sought to present and reflect on the perceptions of seven mathematics teachers from an integrated high school about high abilities/giftedness (HA/G). From the impressions about the concept of HA/G, passing through characteristics that draw or would draw the attention of those teachers in the classroom, to strategies they adopt or would adopt in class, and issues they would like to learn about the topic.

The results showed that the concept of HA/G presented by the teachers has connections with Renzulli's (2018) three-ring theory regarding above–average knowledge. However, some concepts presented seem to be based on common sense and permeated by myths and stereotypes. (Pérez, 2012)

Regarding the characteristics of HA/G students that draw or would draw the attention of this teaching team, the results indicated factors such as (1) speed and ease of learning; (2) focus on topics of interest to them; (3) creativity and curiosity; (4) voracity in learning content; (5) above–average ability, to the point of surpassing the teacher's knowledge; and (6) outstanding performance in written assessments, such as exams, Olympics, and academic competitions.

Note here that factors (1) and (6) are supported by the Brazilian definitions of HA/G (Brasil, 2001; 2020), while the others are part of Renzulli's three-ring theory (2018), namely: (2) and (4) are part of the "commitment to the task" link, (3) is part of the "creativity" link, and (5) is part of the "above average skill" link.

Regarding the types of strategies that teachers adopt or would adopt when knowing that there is a HA/G student in the class, the results obtained indicated: (1) the use of more difficult and in-depth exercises and test questions; and (2) extracurricular activities. It is important to emphasise here the relevance of developing an individualised educational plan (IEP), provided for by law, to map the learning styles and interests of that HA/G student.

As for the issues that teachers would like to learn about HA/G, the results showed the following topics: (1) the concept of HA/G; (2) HA/G screening indicators; (3) regular and extra-classroom care strategies; and (4) how a HA/G student development and learning occurs. Such topics demonstrate the teaching staff's evident concern in identifying and assisting those students.

Finally, we consider that although teachers have perceptions close to the present theories and current legislation, some still lack theoretical depth. Thus, it is necessary to professionalise the processes of identification and assistance to HA/G students through continuing teacher education, as recommended by the thesis from which this text originates.

AUTHORSHIP CONTRIBUTION STATEMENT

TSS was responsible for the theoretical framework and data collection. MG was responsible for guiding the theoretical assumptions, for the methodological referrals, and for the follow up of the writing. The results and final considerations were discussed and written by both authors.

DATA AVAILABILITY STATEMENT

The authors agree to make their data available upon reasonable request from a reader. It is up to the authors to determine whether a request is reasonable.

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