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Teaching Gifted Students in Mathematics: A Literature Review

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ABSTRACT
Mathematics is a fundamental subject in primary and secondary education. It is also a subject that requires students to think deeply and to relate known facts to new concepts. In this subject, gifted students stand out for the variety of their questions, their thinking, and their problem-solving style. To support their intellectual growth, it is important to provide them with opportunities to develop their skills. This article presents a review of the literature on the education of gifted students in mathematics. It emphasises the importance of providing gifted students with opportunities to develop their skills and reach their full potential. The article discusses different teaching methods such as cooperative learning and mathematical modelling, and tools such as GeoGebra. It highlights the need for a comprehensive approach to the education of gifted students, including identification procedures, specialised training for educators, and appropriate resources and support systems. The article also examines the challenges and barriers faced by gifted students and argues for prioritising their education. The aim of the article is to explore and present best practices and recommendations for working with gifted students in mathematics. Therefore, the purpose of this study is to address the educational options for gifted and talented children and the modern tools that can be used for this purpose through a literature review.
keywords: gifted students, mathematics, mathematical modelling, personalisation

1. Introduction

While pupils with special needs receive individual attention and important support, it is important to recognise that gifted pupils sometimes do not receive the same attention. This oversight represents a major disadvantage in the development of future intellectuals and ultimately reduces the overall quality of education in society.

1.1. Definition of Gifted Students

In general, the definition of giftedness varies widely between authors. The authors of the articles emphasise that teachers have an important role to play in the education of the gifted, as good teachers can have a lasting positive impact on their creative thinking in mathematics and on their development and achievement. Teachers who teach the gifted are expected to have the following qualities: correctly identify what students know and do not know, provide explanations in a way that motivates and challenges them, provide constructive feedback and opportunities to adapt teaching techniques and methods, and cultivate motivation and self-confidence in them (Khalil and Accariya, 2016). Teaching the gifted is therefore neither simple nor easy.

By developing an individual's potential, he or she achieves outstanding results and develops innovative strategies that are recognised as excellent or exceptional. An outstanding individual

is someone who stands out from the majority in a particular area, not just the average (Bezić, 2019).

Gifted students are those who demonstrate above-average qualities in (Bezić, 2019):

- In the intellectual domain (general or specific), manifested in convergent thinking,
- in the field of learning (general or specific),
- in the field of creativity (art, science, technology or sport), manifested in divergent thinking, originality, flexibility and fluency,
- Talent in one of the artistic fields (music, dance, art, drama, film, literature),
- psychomotor and physical motor skills
- social skills and
- self-regulation (motivation, emotions, metacognition).

Creative thinking, which is also characteristic of some gifted people, involves a completely different style of thinking when it comes to finding different solutions and interpretations, making different mathematical connections, using different techniques, and thinking in an original and different way. In other words, creative thinking is part of the process of solving problems that require new approaches or results (Leikin, 2011).

Gifted and talented children represent a population that deserves special attention in terms of their social, emotional, and cognitive development, interests and abilities. Prioritising their education is essential to meet their specific developmental needs and to provide them with opportunities within the educational environment that are appropriate to their abilities. It's also vital to recognise that education for these individuals is a multifaceted process involving identification, assessment, and guidance.

Many gifted and talented students are usually found in mainstream educational settings alongside their typically developing peers. Within these contexts, they may or may not take full advantage of the opportunities available to them. This situation underlines the importance of our study, which aims to explore the educational prospects of gifted and talented children. Specifically, we want to explore how these gifted individuals can be effectively taught and supported, and how modern educational tools can be integrated to enhance their learning experiences (Baykoç et al., 2014).

1.2. Literature Review

Researchers are grappling with the question of how best to meet the unique and differentiated needs of gifted learners (Mofield, 2020). This effort is particularly important as gifted learners are often integrated into mainstream school settings without the necessary accommodations to build on their abilities, attributes, and interests (Brigandi et al., 2019).

Research on creativity has led to the development of various creative strategies, such as brainstorming and problem-solving techniques. These strategies share a common goal: to create an environment conducive to enhancing an individual's creative abilities, particularly their ability to generate innovative ideas. In today's technological age, educational institutions have evolved significantly from the traditional model, which relied heavily on face-to-face interaction between students and teachers. Modern schools are now equipped with computer-based learning environments that have revolutionised the learning process. Given the pressing need for creative thinkers today, it is imperative to examine the role of educational institutions that integrate computers into their curriculum (Aqda, 2011).

Some researchers advocate an approach to teaching in which teachers design challenges that are accessible to all students, including the most able. In this approach, teachers provide coherent explanations and encourage critical evaluation of innovative and imaginative solutions. Assessment practices, both formative and summative, are carefully designed to provide students with opportunities for higher order thinking, such as problem generation, generalisation of patterns, unique problem-solving techniques, and synthesis of different mathematical concepts. In addition, teachers are encouraged to model themselves as engaged mentors who not only appreciate the value of mistakes, but also enjoy the process of solving complex problems. By embodying this enthusiasm for problem solving, teachers instil a sense of shared joy in students and foster a classroom culture that fosters resilience, creativity, and a deep appreciation for the beauty of mathematics (Singer et al., 2016).

A growing body of research highlights the significant influence of mindset on students' academic performance. It has become increasingly clear that students tend to hold strong self-beliefs about the adaptability or permanence of their academic abilities. Moreover, studies have revealed a remarkable trend: both teachers and students are more likely to attribute success in mathematics to innate talent than to success in other academic disciplines. It's worth noting, however, that the prevalence of strong beliefs about the inherent nature of mathematical ability may have overlooked the potentially unique effects of mindset interventions in mathematics. This oversight may be due to research reviews and meta-analyses that have focused primarily on broader effects and haven't explored the nuances of domain-specific effects (Bui et al., 2023).

Ways of learning such as differentiated teaching are emerging. This is the only way to dynamically adapt the curriculum to the individual characteristics of learners, including factors such as their abilities, readiness, interests and learning profiles (Tomlinson, 2014). Technology has an important role to play in this. In essence, technology enables teachers to equip gifted and talented students with essential 21st century skills such as critical thinking, problem solving and self-regulation.

In addition, it's recommended that open-ended questions, mathematical modelling, computational modelling, and tasks with multiple solutions are incorporated into the teaching approach (Kozlowski & Chamberlin, 2019; Levenson et al., 2018; Lin, 2017).

The use of artificial intelligence (AI) technologies to emulate teacher knowledge and expertise to provide personalised support and guidance to individual learners has received much attention as a possible solution (Pai et al., 2021; Xiao and Yi, 2021; Hwang et al., 2020).

2. Method

In this literature review, we conducted an extensive search of peer-reviewed articles in reputable databases such as Sage, Elsevier, ProQuest and Taylor Francis. Our main aim was to gain insight into the contextualisation of mathematical giftedness in different countries and to identify different methods and contemporary tools used in mathematics education. To navigate effectively through this large body of literature, we used simple keywords directly related to these focus areas.

In making our selection, we deliberately avoided including articles that mentioned specific levels of learners (such as primary, secondary, or upper secondary), specific age groups or specific types of educational institutions. Our main inclusion criteria were the presence of the precise term 'gifted learners' in the article, the explicit mention of a specific country in the title of the article, and a publication date no earlier than 2010. This rigorous approach ensured that

our review provided a comprehensive overview of relevant and recent literature while maintaining a broad scope for comprehensive analysis.

2.1. Purpose of the Study

This article aims to provide a comprehensive review of the literature on giftedness and gifted education, with a particular focus on different global contexts. We aim to present a nuanced perspective by exploring how authors from different countries articulate the nuances of mathematics education for gifted learners.

This exploration involves a multifaceted examination of how these representations are manifested, recognising that differences may manifest themselves in different ways. This review focuses on distinguishing the unique barriers faced by individual countries and understanding the multiple ways in which these challenges affect different stakeholders at different levels of education.

2.2. Research Questions

1. How to teach gifted students?
2. Which modern tools should be introduced into lessons for the gifted?

3. Results

Some researchers are exploring interventions involving contextual personalisation, a teaching strategy that aligns curriculum content with students' interests in areas such as sport, cinema, or gaming. It's worth noting that the extent to which students are quantitatively immersed in their areas of interest, and the extent to which problem-solving tasks are designed to reflect how students engage with their areas of interest, play a key role in the successful implementation of personalisation in an AI-driven learning environment (Walkington & Bernacki, 2019).

In a study by Hooshyar, an innovative approach was used that included an online game-based formative assessment within a flowchart-based intelligent tutoring system. The research results showed a remarkable change in the 52 university students who participated. Their interest in learning, attitudes and performance in computing were significantly improved following the learning activity. In addition, the results showed a clear advantage for the experimental group in using effective help-seeking strategies, surpassing the performance of the control group. This suggests that adaptive learning systems have the potential to significantly improve students' overall learning outcomes and performance compared to traditional computer-based learning systems (Hooshyar et al., 2016).

The effectiveness of a learning agent in an educational context has been the subject of various research efforts. This educational software, called learning agents (LA), implements the pedagogical approach of learning by teaching. In this approach, the human learner takes on the role of the teacher, instructing the teaching agent and, in the process, deepening his or her understanding (Gulz et al., 2020).

Numerous studies have explored the integration of agent-based learning games into school settings, highlighting the pedagogical potential of LA-based games. This research has consistently demonstrated the significant benefits, which include both improved learning outcomes and increased student motivation (Pareto et al., 2012; Lindström et al., 2011). The use of LA-based games has shown promise in improving various facets of learning, including increased time spent learning, increased willingness to review material, increased propensity

to seek additional information, improved conceptual understanding, enhanced metacognitive abilities, increased task completion rates, and more (Gulz et al., 2020).

There is a notable emphasis by researchers on the concept that has been brought to light - the importance of differentiated instruction using technology as a versatile teaching strategy. This approach enables educators to tailor their teaching methods, thereby promoting opportunities to meet the unique and varied needs of each student (Alshareef et al., 2022). Differentiated Instruction stands out as an approach to teaching that introduces a significant degree of adaptability into educators' practices. It enables them to dynamically adjust the curriculum in response to students' characteristics, which include factors such as their abilities, readiness, interests and learning profiles (Tomlinson, 2014).

Useful Technology has a dual role to play in education. Not only does it help teachers differentiate instruction, but it also serves as a valuable pedagogical and creative tool for the most advanced and gifted learners (Periathiruvadi & Rinn, 2012). In essence, technology enables teachers to equip gifted and talented students with essential 21st century skills such as critical thinking, problem solving and self-regulation.

Many applications are not only popular, but also provide valuable tools for research purposes. These applications include Symbolab, GeoGebra, Maths Solver, iMathematics, Cymath, WolframAlpha, QuickMath, Microsoft Math Solver, Chegg Math Solver, MathPapa, Maple Calculator, Tiger Algebra, Gauthmath, GeoGebra and similar options (Booc et al., 2023). The versatility of these applications makes them well suited for inclusion in the mathematics curriculum for gifted students.

3.1. Teaching Mathematics for Gifted Students

Teachers need to be committed to continuous professional development, actively researching the latest developments in mathematics education, and attending events such as conferences, seminars, meetings and specialised training in mathematics. This continuous learning ensures that teachers keep abreast of relevant knowledge, effective teaching methods and strategies that enhance the learning environment. Teachers need to be creative in their teaching by choosing examples that resonate with students' real-life experiences. Teachers should also bridge the gap between abstract mathematical concepts and tangible, real-world applications, thereby fostering students' understanding of and enthusiasm for mathematics. Such an approach to mathematics education not only facilitates the social integration of students, but also cultivates their critical thinking skills. When mathematics is meaningful and relatable to the individual, it transcends mere exam-oriented memorisation. Each student has unique talents and teachers should encourage their development, using various modern illustrative tools to effectively support their learning journey (Algani, 2019).

Coe emphasises the integration of mathematics with creative techniques such as magic squares, crosswords and decoding to make mathematics more engaging. She highlights the importance of promoting mathematical entertainment, where students use multiple calculations and mathematical principles sequentially to establish relationships and use tools such as mazes and knowledge maps. Coe also stresses the importance of using contemporary teaching methods. Teachers are encouraged to cultivate strategies that promote collaboration and teamwork among students, as these have been shown to have a positive impact (Coe, 2018).

In addition, the use of computational modelling to solve mathematical problems, as highlighted by Lin et al, can help students to develop valuable research skills, the ability to analyse experimental data and develop independent critical thinking (Lin, 2017).

Mathematical modelling requires students to engage in the construction of representations. This concept of constructing representations aligns with the highest level of Bloom's Taxonomy (Irvine, 2017), making it an appropriate and intellectually stimulating endeavour for mathematically gifted students. Mathematical modelling takes mathematics beyond its abstract boundaries and into the realm of real-life mathematical interactions, thereby promoting a deeper level of understanding and synthesis within the subject (Lesh et al., 2000). A specific category of mathematical modelling activities known to foster creativity and provide robust support for gifted mathematics students is the practice of model elicitation activities (Gilat & Amit, 2013). This practice not only encourages creative thinking but also serves as a valuable means of identifying and nurturing students with exceptional creative talent in mathematics. Mathematical modelling activities allow mathematics to mimic real-life mathematical interactions, allowing for deeper development and synthesis of mathematics. (Kozlowski & Chamberlin, 2019).

Multiple solution tasks are also an approach to teaching gifted and talented students. Such an approach requires students to think differently and create different ways of generating solutions (Levenson et al., 2018).

Open-ended questions are recommended when teaching mathematically gifted students as these questions challenge them, cover a range of possible answers and offer multiple possible solutions (Levenson et al., 2018). In a study by Basister and Kawai (2018), Japanese schools with mathematically gifted students were examined in detail to identify common features in their classrooms. The researchers' findings highlighted a common feature of these classrooms - the inclusion of open-ended tasks and questioning (Basister & Kawai, 2018). This pedagogical approach is useful in meeting the specific needs of gifted students, as it fosters an environment rich in mathematical exploration. The open-ended challenges that underpin this approach allow students to use their creativity and diverse mathematical skills. These challenges not only stimulate critical thinking but also provide a broad platform for honing mathematical skills, enabling gifted students to reach their full potential and access a wide range of mathematical competencies (Kozlowski & Chamberlin, 2019).

3.2. Modern Tools for Teaching Mathematics

3.2.1. Primary School

Olafenko and his team reported using interactive exercises from Learningapps.org. These exercises allow users to engage in practical activities such as arranging items in the correct order, selecting the correct answers, solving crossword puzzles, tackling various puzzles, and grouping elements. The platform offers many templates for trainee teachers and a library of pre-designed interactive exercises that can be used as templates. These resources are a great help in creating didactic exercises suitable for specific grade levels and topics of study. In addition, completed projects can be conveniently saved either locally or on a network (Olafenko et al., 2019).

GeoGebra is very popular and useful nowadays. It is a dynamic geometry package. You can construct points, vectors, distances, lines, cones, and functions - all elements can then be modified dynamically. On the other hand, we can enter algebraic equations for lines and cones, coordinates, and numbers. All objects can be calculated, so we can already speak of CAS systems for these objects. These two functions are a special feature of GeoGebra. An expression in the algebra window corresponds to an object on the board and vice versa. This is also the input case - either by selecting the appropriate input mode with the mouse on the drawing area, or by typing the appropriate command on the command line. GeoGebra was

written in Java, which allowed the creation of applets that could be easily published on the web by integrating the applet using a Java plug-in. As this technology was dying out in web browsers, the creators of GeoGebra updated the system with a JavaScript compiler at the right time. As the source code has remained Java, it is now possible to create all applets in the web version of the program, upload them to your web server and then embed them in your web pages. GeoGebra gives an overview of the planar and analytical content of point sets, which are most often considered in the plane. It is translated into several languages (Olafenko et al., 2019, Tamam & Dasari, 2021, Kramarenko et al., 2020, Suryani & Rofiki, 2020).

Problems with the square and the volume of shapes can be programmed in Geogebra. The task is to find which of the figures has the largest width and volume. These can be text problems of the type "connect the dots". The result is a Christmas tree (Olafenko et al., 2019).

Özçakir's study used GeoGebra as a learning tool via tablets. In these activities, they only moved the points and line segments by touching and dragging (Özçakir et al., 2020).

3.2.2. Secondary School

Das emphasises the importance of incorporating information and communication technology (ICT) into mathematics teaching, highlighting two valuable tools: Maxima and SymPy. Maxima is an algebra solver based on the Lisp computer language and compatible with various POSIX platforms such as Linux, Unix, OS X and BSD. It uses Gnuplot for graphical visualisation. On the other hand, SymPy is a Python library designed for symbolic mathematics. Its goal is to evolve into a comprehensive computer algebra system (CAS), while keeping the code simple for better understanding and extensibility (Das, 2019). These two tools are used alongside the classic spreadsheet for simple calculations. They can also be used to draw graphs, solve quadratic equations, draw common geometric figures such as triangles, cubes, etc. or trigonometric angles, for example to measure distances in real life (Das, 2019).

When teaching gifted students, it's important to encourage interactivity and engage them in enriching activities. Incorporating collaborative learning experiences is key. For geometry-focused tasks, the use of tools such as Wolframalpha, Maplesoft, GeoGebra, Sketchpad and Cabri can greatly enhance the learning process. These resources are valuable not only for hands-on geometry activities, but also for effective demonstrations and comprehension exercises where appropriate. Incorporating interactive applications such as Geogebra Graph and Desmos can bring mathematics to life by modelling real-world situations and allowing students to draw meaningful conclusions. It is also important to create a dynamic learning environment with room for questions and discussion. The use of applications such as Quzizz, FlipQuiz and Kahoot Classic Mode can facilitate engaging Q&A sessions and stimulate fruitful discussions among gifted students (Cildir, 2020).

In Liburd's investigation, students used GeoGebra to find the intersection of the graph of linear functions, the x-intercept and the y-intercept, to find the slope of a line, to find the equation of a line, to solve problems involving the slope of parallel and perpendicular lines, to find (a) the length and (b) the coordinates of the centre of the line from the distant coordinates, and to draw the graphs of linear functions (Liburd & Jen, 2021).

3.2.3. Faculty

In various scientific articles, researchers discuss several examples of the use of tools to promote mathematical computational thinking, of which NetLogo and Mathematica are notable examples. NetLogo, known as a tool for computational modelling, is proving to be a powerful resource for improving mathematics education while developing computational thinking. Mathematica is another valuable tool for teachers and students. This computer algebra system

allows students to strengthen their computational thinking skills by delving into algorithms designed to solve complex computational problems, as shown by (Jun & Yoon, 2016, Jun, 2020).

Rézio proposed pedagogical challenges in which students used Desmos (for graphing) and Symbolab Math Solver (for integral calculus). The first chapter covered three topics: differential calculus, integral calculus, and series. The content of integral calculus, the unit in which this pedagogical challenge is embedded, included counterflow and area calculation (Rézio et al., 2022).

According to Booc, Mathway has more than 9 million monthly active users and has solved more than 1.3 billion problems. Symbolab had more than 200 million users worldwide and Photomath had 6.5 million monthly users. In addition to these three, there were several other mathematical applications (Bitter & Corral, 2015): Bitt and Bomba: Graphing Calculator, Maths Solver, iMathematics, Cymath, WolframAlpha and QuickMath, Microsoft Math Solver, Chegg Math Solver, MathPapa, Maple Calculator, Tiger Algebra, Gauthmath, GeoGebra and the like (Booc et al., 2023).

Several authors have conducted evaluations of the widely used ChatGPT. Frieder's research suggests that ChatGPT excels when used as a mathematical assistant for basic fact-finding tasks, effectively acting as a mathematical search engine and knowledge base interface. It is particularly useful for undergraduate-level mathematics. However, when faced with more complex, graduate-level mathematical intricacies, the performance of both GPT-4 and ChatGPT falls short. Despite the numerous positive media reports praising the problem-solving abilities of GPT-4 and ChatGPT, particularly in exam-like scenarios (which may be the result of selective reporting), their overall mathematical proficiency does not meet the rigorous standards expected at the graduate level (Frieder et al., 2023, Plevris et al., 2023).

ChatGPT can provide comprehensive teaching and support in the study of geometry, and public discussion on social networks is generally positive and enthusiastic about the use of ChatGPT in mathematics teaching and educational settings. However, there are also concerns about its use. Wardart's study investigated the user experience in three educational scenarios. ChatGPT does not have a deep understanding of geometry and cannot effectively correct misconceptions. The accuracy and performance of ChatGPT solutions may depend on the complexity of the equation, the input data and the instructions given to the ChatGPT program. ChatGPT has demonstrated an impressive ability to handle mathematical tasks, including manipulating algebraic expressions and solving complex calculus problems with ease. In addition, ChatGPT has demonstrated its ability to handle more advanced mathematical challenges such as integrals, derivatives, and differential equations. However, it's important to note that while ChatGPT can provide solutions, the efficiency and accuracy of these solutions may vary. As a best practice, it's advisable to check the results obtained from ChatGPT with another trusted source or calculator to ensure accuracy and reliability (Wardat et al., 2023).

4. Discussion and Conclusion

Research findings consistently underline the importance of tailoring educational tasks to the needs of gifted students. Among these tailored tasks, three distinct categories stand out: open-ended tasks, multiple-choice tasks and mathematical modelling tasks. These types of tasks are effective in fostering creativity and the development of mathematically gifted students. Importantly, these tasks don't just benefit the gifted; they also provide valuable learning opportunities for other students in the classroom. These tasks have specific characteristics, such as fluency, flexibility, and originality, which enable students, including those who are developing their mathematical skills, to engage with mathematical content in a way that suits

their learning styles and levels of ability. This inclusive approach to task design ensures that all students can access and explore mathematical concepts in a way that is appropriate to their individual needs and aptitudes (Kozlowski & Chamberlin, 2019).

Supporting the educational journey of gifted learners requires a multifaceted approach based on interactivity and engaging pedagogical practices. To this end, a key strategy is to integrate collaborative learning experiences. Researchers recommend open-ended tasks, multi-solution tasks, mathematical modelling, computational modelling and mathematical entertainment. And this is the answer to the first research question, which was how to teach gifted students.

Tools such as WolframAlpha, Maplesoft, GeoGebra, Sketchpad and Cabri have the potential to take the teaching of geometry to new heights. They not only facilitate hands-on geometry activities but also serve as effective tools for demonstrations and comprehension exercises when needed.

These versatile resources enable educators to create immersive learning experiences that go beyond the traditional classroom. In addition, the integration of interactive applications such as Geogebra Graph, Desmos, and Symbolab brings an element of dynamism to the mathematics classroom. These applications allow students to model real-world scenarios, encouraging them to derive meaningful insights and make connections between theoretical concepts and practical applications.

In the quest for a dynamic and engaging learning environment, incorporating opportunities for questioning and discussion is key. This is where applications such as Quzizz, FlipQuiz and Kahoot Classic Mode come into play, facilitating engaging question-and-answer sessions, and encouraging lively discussions among gifted students. These platforms not only enliven the learning process but also empower students to actively participate, question and explore the fascinating world of mathematics.

Artificial intelligence (AI) has emerged as a powerful ally in mathematics education. AI-powered tools can adapt to individual learning styles and paces, providing tailored lessons and exercises that challenge gifted students at their unique levels. These tools can also track progress and provide real-time feedback, creating a personalised and engaging learning experience. A variety of educational games have been used to capture the interest of gifted maths students. These games combine entertainment with learning, providing interactive and engaging experiences that stimulate mathematical thinking. They often include problem-solving challenges, puzzles and mathematical scenarios that encourage critical thinking and creativity. A specific software application, such as NetLogo and Mathematica, has gained recognition for its role in improving mathematics education. NetLogo, as a computational modelling tool, develops students' computational thinking skills. Mathematica, on the other hand, serves as a valuable computer algebra system that allows students to explore complex mathematical algorithms, especially in subjects such as calculus (Jun & Yoon, 2016). Learning agent-based games represent an innovative approach to mathematics education. In these games, students often take on the role of the teacher and instruct a digital learning agent. Through this process, students develop their understanding of mathematical concepts while also developing their teaching and problem-solving skills.

Differentiating instruction is a pedagogical strategy that tailors instruction to meet the diverse needs of students. In the context of gifted mathematics students, differentiation involves adapting content, pace, and complexity to challenge them appropriately. It ensures that gifted students are continuously engaged and challenged in their mathematical learning. Personalisation takes differentiation a step further by tailoring learning experiences based on individual students' interests, readiness and learning profiles. Advanced analytics and AI-

driven algorithms can generate personalised learning paths, suggesting relevant resources and activities that match each student's unique mathematical aptitude (Gulz et al., 2020).

Research shows that ChatGPT is particularly effective when used as a mathematical tool, especially for basic fact-finding. In this capacity, ChatGPT functions seamlessly as a powerful mathematical search engine and serves as a valuable conduit to access a wealth of mathematical knowledge.

All of these tools are answers to the second research question, which was what modern tools should be used in the teaching of mathematics to gifted students.

Together, these tools and methods form a dynamic landscape for the education of gifted students in mathematics. By harnessing the power of technology and innovative pedagogical approaches, educators can create a learning environment that not only challenges gifted students but also nurtures their passion for mathematics, fostering a lifelong love of the subject.

Gifted students in mathematics are best promoted through different approaches to problem-solving and posing, discourse and questioning, creativity, and innovation, challenging mathematical tasks, curricula and textbooks, in-school programmes and activities (in terms of ability grouping, self-contained classes and specialised schools, acceleration and promotion) and out-of-school programmes and activities (in terms of recreational mathematics and competitions) (Singer et al., 2016).

It is very important for society that gifted students are allowed to develop their intellectual abilities and are encouraged to think, solve problems and express their ideas and questions. In this way, we can contribute to the development of individuals and society.

It is difficult to assess how work with gifted students will be carried out in the future, but it is a fact that the emphasis will be on new technologies that are not yet known. However, it may also be the case that the gifted will have to find their way through the flood of information and applications and use ICT to develop their potential.

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