Curriculum Models in Gifted Education: A Comparative Study for 21st-Century Schools

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Abstract

The field of gifted education continually seeks effective pedagogical frameworks to foster the intellectual growth, creativity, and socio-emotional development of advanced learners. While numerous curriculum models exist, a comprehensive comparative analysis addressing their practical application and implications for diverse gifted populations remains underexplored. This study addresses this gap by conducting a comparative literature review of prominent curriculum models in gifted education, including the Enrichment Triad Model, Parallel Curriculum Model, Autonomous Learner Model, Maker's Curriculum Modification Model, The Purdue Three-Stage Model, School-wide Enrichment Model, Talent Search Model, Grid: Depth and Complexity Model, Multiple Menu Model, Integrated Curriculum Model, and Talent's Unlimited Model. By systematically examining their key features, underlying principles, target learners, and inherent strengths and limitations, this research provides a timely and necessary resource for educators and policymakers. The findings underscore the imperative of aligning curriculum model selection with established gifted education principles and highlight the crucial roles of teachers, parents, gifted learners, and other school stakeholders in this decision-making process. Ultimately, this comparative analysis aims to guide practitioners in making informed choices that maximize student potential and optimize educational outcomes within varied gifted education context. The paper concludes by underscoring the importance of aligning curriculum model selection with gifted education principles and considering the roles of teachers, parents, gifted learners, and other school stakeholders in the decision-making.

Keywords: *Curriculum model*, *gifted education*, *enrichment*, *talent development*, *curriculum differentiation*

INTRODUCTION

Gifted education necessitates specialized curricula that cater to the unique cognitive and affective needs of gifted learners, moving beyond the standard curriculum to foster their advanced capabilities (Pawilen & Manuel, 2018). Gifted and talented learners require a curriculum that will challenge them to use the knowledge that they gained to create meaningful outcomes or outputs. These students possess precocity, intensity, and complexity, requiring differentiated instruction and curriculum to enable them to reach their full potential (Chan, 2015). An appropriate curriculum should not only cater to their accelerated pace of learning but also nurture their social-emotional development and critical thinking abilities (Subotnik et al., 2011). Curriculum models in gifted education provide frameworks for educators to design and implement effective learning experiences tailored to these exceptional students (VanTassel-Baska & Brown, 2007). These models offer a variety of strategies and approaches to address the diverse needs of gifted learners, focusing on adjusting depth, complexity, and pacing to promote optimal growth (Ronksley-Pavia, 2010).

This paper undertakes a comparative study of prominent curriculum models in gifted education, analyzing their theoretical underpinnings, practical applications, and effectiveness in fostering academic and personal growth among gifted students (Göksu & Gelişli, 2023). Previous research has explored various curriculum models in gifted education, often focusing on their individual characteristics and effectiveness (Göksu & Gelişli, 2023; VanTassel-Baska & Brown, 2007). For instance, studies have documented the efficacy of models like the Schoolwide Enrichment Model and the Talent Search Model (VanTassel-Baska & Brown, 2007). However, a comprehensive comparative

analysis that systematically examines the key features, underlying principles, target learners, strengths, and limitations of a broad range of prominent curriculum models within a single framework is less common. A comparative analysis of curriculum models can illuminate how different approaches address or exacerbate these inequities, offering insights into fostering inclusive and equitable learning environments for all advanced learners. The ongoing debate about whether gifted education should be separate or integrated into a common program further accentuates the relevance of such a study (Alqahtani & Kaliappen, 2020).

METHOD

This paper will utilize a comparative approach to examining different curriculum models in gifted education. A comparative study refers to a systematic analysis that juxtaposes multiple entities—in this case, diverse curriculum models—to identify their similarities, differences, strengths, and weaknesses (VanTassel-Baska & Brown, 2007). This methodology allows for a nuanced understanding of how each model addresses the unique learning needs of gifted students, enabling a more informed selection process for educators and policymakers (García-Martínez et al., 2021). By reviewing various models, this study aims to elucidate the strengths and weaknesses of each approach, providing educators and policymakers with insights into effective strategies for nurturing gifted students.

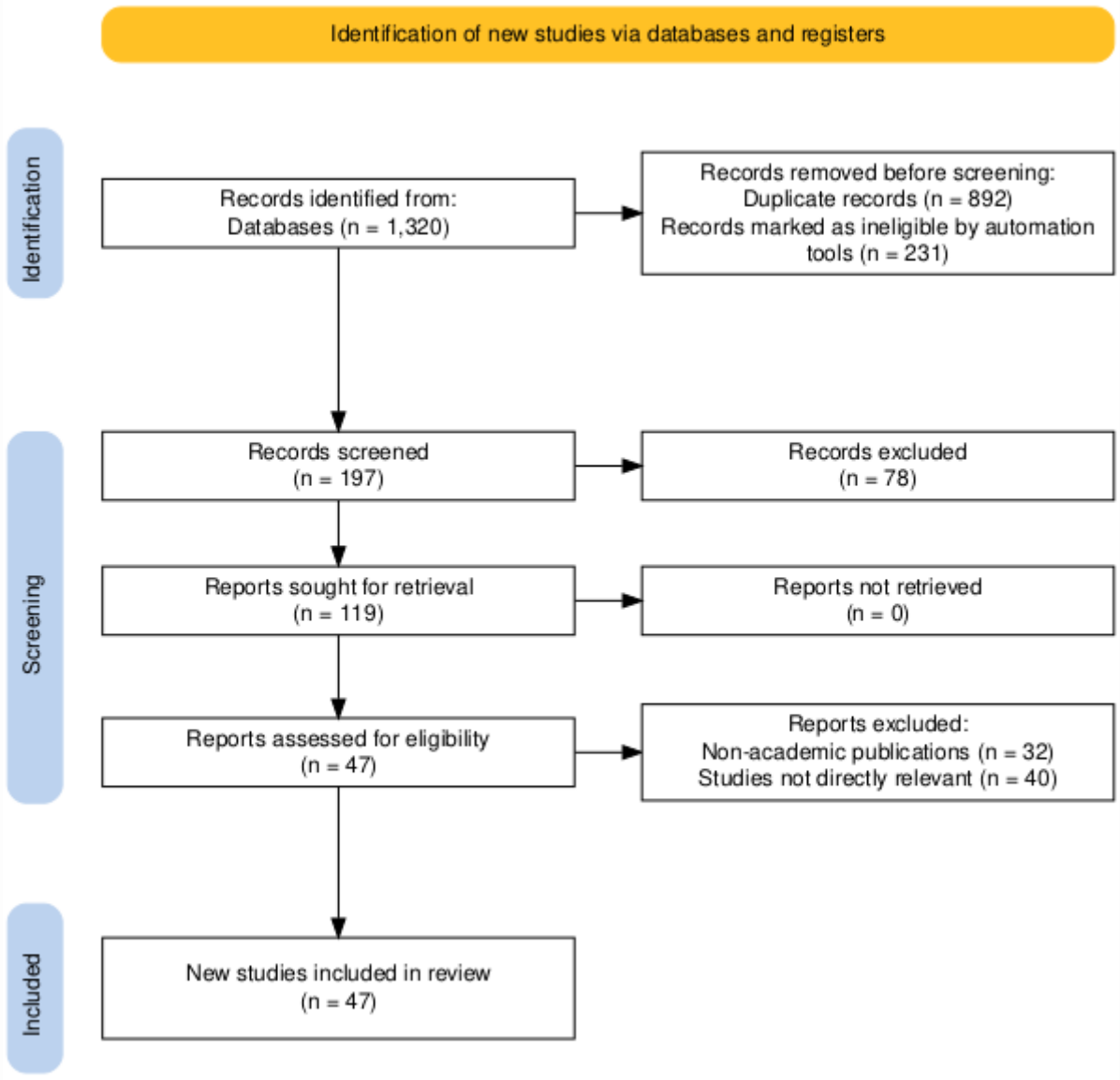

Figure 1. Illustration Prisma Diagram of Literature Review

The initial phase involved an extensive literature review, which encompassed academic journals, books, conference proceedings, and reputable organizational reports, to identify and categorize prominent curriculum models specifically designed for gifted learners (Göksu & Gelişli, 2023). This phase involved reviewing foundational texts, handbooks, and meta-analyses in the field to create a preliminary list of models. Specifically, a comprehensive search strategy will be developed to identify relevant studies across multiple academic databases, including PsycINFO, Web of Science, Scopus, and ERIC. Keywords such as "gifted education curriculum," "curriculum models," "differentiation," "enrichment," and "acceleration" will be used in various combinations to ensure a broad yet targeted search. The identified models will then be categorized based on their primary theoretical orientation, such as those emphasizing content enrichment, process differentiation, or product creation, to facilitate a structured comparative analysis (VanTassel-Baska & Wood, 2009). Relevant sections of articles, books, and chapters were meticulously read, summarized, and cataloged to extract pertinent data. The collected data for each model were then organized within the analytical framework. A cross-model comparison was performed for each dimension, allowing for the identification of patterns, similarities, and differences across the models. This analytical phase involved critical evaluation of each model's theoretical coherence, practical applicability, and reported effectiveness. The final stage involved synthesizing the findings into a coherent narrative. The comparative insights were used to draw conclusions about the strengths and weaknesses of different approaches and to articulate the unique contributions of this study to the existing literature.

RESULTS AND DISCUSSIONS

Enrichment Triad Model

The enrichment triad model is proposed by a well-known psychologist and scholar in gifted education, Joseph Renzulli (Schlichter, 1981). This model is a comprehensive approach designed to cultivate talents and creative productivity in young people (Reis et al., 2021). This model has three types that include Type I enrichment activities, which are designed to expose students to a wide variety of topics, disciplines, occupations, hobbies, people, places, and events that would not ordinarily be covered in the regular curriculum; Type II enrichment, which involves the use of specific methods, materials, and instructional techniques that promote the development of thinking and feeling processes; and Type III enrichment, which involves students in becoming investigators of real problems (Reis & Renzulli, 2003). These enrichment clusters are groups of students who share common interests, and they come together to pursue those interests (Chandra, 2020). However, Renzulli emphasized in this model that enrichment can be used for all students, not just those labeled as gifted (Renzulli et al., 2007). This model encourages a dynamic and flexible structure of enrichment clusters, which encourages movement between enrichment types rather than a linear progression. This model also underscores real-world problem-solving, where gifted learners often work on authentic issues with the goal of creating unique products and original solutions. This model is designed to supplement the regular curriculum and not to replace it.

The Enrichment Triad Model operates on the premise that students learn best when they are allowed to explore real-world problems or topics that ignite their passion and curiosity (Moller, 1986). The model emphasizes student choice and self-direction, allowing students to select areas of interest and develop projects that align with their personal strengths and goals (Renzulli, 1976). The model is based on a learning theory that promotes creative productivity and giftedness by allowing students to apply advanced content, process-training skills, and methodology to self-selected areas of interest (Renzulli & Renzulli, 2010). The model provides a framework for integrating different types of enrichment experiences, providing the best opportunities for students to enhance their talents and interests (Reis & Peters, 2020).

The Enrichment Triad Model is effective at fostering student autonomy and creativity, allowing students to delve into areas of interest and develop authentic products and services (Renzulli & Renzulli, 2010). It fosters independence and creativity where teachers serve as facilitators for self-directed learning and creative problem solving. The flexibility of this model allows educators to tailor enrichment experiences to the unique needs and interests of individual students, promoting

personalized learning pathways (Renzulli, 1976). As this model promotes personalization, it engages students by connecting learning to real-life interests. One limitation of this model is that it requires significant resources, including time, materials, and trained personnel, to implement effectively. Another challenge is the need for ongoing professional development to help teachers effectively facilitate student-directed projects and provide guidance and support to gifted learners. Because of its flexibility and personalized learning, measuring growth and success becomes less straightforward compared to a standardized curriculum.

Parallel Curriculum Model

The Parallel Curriculum Model (PCM) is a comprehensive model that allows educators to design or modify existing curricula in order to meet the needs of advanced learners, as well as other students with a wide range of abilities (Renzulli et al., 2010) This model was developed primarily by Carol Ann Tomlinson and colleagues. This model has four parallel curriculums, which include the core curriculum, curriculum of connections, curriculum of practice, and curriculum of identity. The core curriculum focuses on essential knowledge, concepts, principles, and skills of the discipline. Its aim is to ensure that gifted learners will gain the fundamental understanding of the subject matter. The curriculum of connections is focused on identifying links across concepts, disciplines, time, and context. This curriculum is designed to help students understand the interdisciplinary nature of knowledge and enhance their ability to transfer learning across different domains. The curriculum of practice is focused on discipline-based performance, application, and expertise. It provides opportunities for advanced learners to apply their knowledge and skills in authentic, real-world contexts, fostering the development of expertise. The last parallel is the curriculum of identity, which is focused on developing personal reflection, growth, and values. It helps students understand how their own identities, values, and beliefs intersect with the content being studied, promoting self-awareness and personal growth (Göksu & Gelişli, 2023). Each of the four parallels can be used independently or in combination to create curriculum that meets the unique needs of gifted learners. It can be adapted for any learner, subject domain, or grade level (Kerr, 2009).

The PCM is inherently flexible, allowing educators to customize learning experiences to students' specific needs and passions (Kerr, 2009). It also moves beyond rote learning by promoting critical thinking, problem-solving, and creativity. It focuses on tasks and applications similar to those valued in real-world environments (VanTassel-Baska & Brown, 2007).

The PCM is based on the idea of ascending intellectual demand. The model encourages educators to analyze students' current performance levels and design intellectual challenges to help them move along a continuum toward expertise. Furthermore, the model recognizes the value of drawing connections across domains and of students reflecting on their learning and its effects on their personal growth. It operates under the premise that gifted students can and should make personal connections to learning tasks.

The PCM allows for a customizable, differentiated curriculum that meets the diverse needs of learners. It promotes deep understanding, critical thinking, and creativity when implemented effectively. When using this model, teachers need to have extensive knowledge of the subject matter, curriculum design principles, and gifted education strategies, as it requires intensive teacher preparation and ongoing professional development. However, the PCM has its own limitations. The comprehensive nature of the PCM can be overwhelming for teachers who are unfamiliar with the model or who lack experience in curriculum design (Pawilen & Manuel, 2018; VanTassel-Baska & Brown, 2007). The assessment of complex, personalized learning outcomes can also pose challenges.

Autonomous Learner Model

The Autonomous Learner Model (ALM) was developed by George Betts and Jolene Kercher with the aim to promote gifted students' cognitive, emotional, social, and autonomous development (Betts & Neihart, 1986). The ALM is structured around five integral dimensions designed to cultivate well-rounded, self-directed learners: orientation, which introduces students to the model and its goals; individual development, focusing on personal growth and self-understanding; enrichment activities, providing opportunities for exploration and creativity; in-depth study, encouraging focused research

and mastery; and seminar, promoting discussion and collaboration (Pahrudin et al., 2024). The orientation dimension helps students to understand the ALM and its various components. It introduces students to the concepts of giftedness, learning styles, and self-directed learning (Pawilen & Manuel, 2018). The individual development dimension addresses the social and emotional needs of gifted learners, focusing on areas such as self-esteem, stress management, and interpersonal skills. The enrichment activities provide opportunities for gifted learners to explore their interests and talents through a variety of experiences, such as field trips, guest speakers, and hands-on projects (Pahrudin et al., 2024). The in-depth study dimension allows gifted learners to delve deeply into topics of interest, conducting research and creating products that demonstrate their understanding. The seminar dimension provides a forum for gifted learners to share their learning experiences and engage in discussions with their peers. The model focuses on the development of self-directed learning skills, personal growth, and social-emotional well-being of the students.

The autonomous learner model operates on the belief that gifted students thrive when given autonomy and choice in their education (Betts et al., 2021). It stresses personalized learning, where curriculum and activities are tailored to individual students' strengths and interests. It promotes self-direction, where the students set goals, select strategies, manage time, and evaluate their progress independently. The model also aims to create a supportive and stimulating learning environment in which students feel safe to take risks and express their ideas. Geared towards lifelong learning, the model aims for students to develop skills and attitudes necessary for continuous intellectual growth (Göksu & Gelişli, 2023).

The ALM encourages self-directed learning, personal growth, and social-emotional development (Jenkins-Friedman, 1983). The model explicitly teaches learners how to learn independently rather than just what to learn. It provides learners the agency for their own learning experiences, leading to greater engagement and motivation. This model is also flexible and adaptable to different contexts and student needs. It allows personalization of learning for learners to pursue areas of interest and talent. However, it requires significant teacher training and commitment, as teachers need to shift from traditional teaching roles to facilitators and mentors. Some learners may find it challenging to take on so much responsibility for their learning, requiring additional support.

Maker's Curriculum Modification Model

Maker's Curriculum Modification Model is one of the models that provides a systematic way to modify curriculum for gifted students, which focuses on adjusting the content, process, product, and learning environment to match their advanced learning needs (Maker, 1986). Developed by June Maker in 1982, this model is a widely recognized framework for differentiating instruction for gifted learners. The model emphasizes four key elements: content, process, product, and learning environment (Ronksley-Pavia, 2010). Content modification involves a modification in subject matter to be taught, which includes making the content more abstract, complex, organized, and economical. By modifying the content, it may broaden and deepen the content scope to allow in-depth exploration. Process modification focuses on the use of higher-order thinking skills such as critical thinking, creative thinking, problem-solving, and decision-making. It fosters active learning through inquiry-based activities, investigations, and real-world applications. By modifying the process, educators can level up the learning experience on how gifted learners will acquire knowledge and improve what they have learned. Product modification allows students to demonstrate their learning through various avenues, such as reports, presentations, performances, or exhibitions. The focus of this modification is the creation of products that solve real-world or authentic problems relevant to the student's interests and societal issues. Products are designed for real audiences beyond the classroom for implementation and testing. Additionally, it promotes self-evaluation of products through established criteria. The learning environment should be student-centered, promoting independence, choice, and risk-taking (Ronksley-Pavia, 2010). Maker suggests that learning environments must be student-centered and promote students independence. The learning environment must also be high mobility, where students can move and explore flexibility.

This model operates on the idea that gifted students require curriculum that is differentiated in depth, complexity, and pace (Ronksley-Pavia, 2010). The model believes that gifted learners benefit

from a curriculum that addresses their advanced ability to manipulate abstract ideas and complexity and make interdisciplinary connections (Kaplan, 2007). The model also suggests that the modified curriculum should be flexible and responsive to individual student needs and interests (Pahrudin et al., 2024). It also underscores the importance of an environment that fosters independence, complexity, and openness, which are crucial for gifted learners' growth.

The Maker's model provides a comprehensive framework for curriculum differentiation that addresses the unique needs of gifted learners (Kaplan, 1981). It is comprehensive, as it addresses modification across multiple dimensions, allowing holistic flexibility. With modifications in the content, the model encourages deep engagement with complex, abstract, and interdisciplinary content that builds on students' prior knowledge and interests. The model also builds student independence, as the model promotes independent learning and self-directed activities. Finally, it emphasizes curriculum compacting, which allows students to skip content they have already mastered to explore other related topics. However, the model requires significant teacher expertise and time for planning and implementation. Implementing modifications, especially real-world projects and flexible environments, may require significant planning time, training, and materials. Also, the model may be challenging to implement in classrooms with large class sizes and limited resources. Some students may also need scaffolding and support to work independently and manage their learning effectively. Likewise, without careful pacing, increased content depth and complexity may overwhelm gifted learners.

The Purdue Three-Stage Model

The Purdue Three-Stage Enrichment Model, initially designed for university students in 1973 by Joseph Feldhusen and Patricia Britton Kolloff, evolved by 1979 to address the needs of gifted and talented learners (VanTassel-Baska & Brown, 2007). The Purdue Model offers program goals, identification procedures, interaction with gifted peers, well-trained instructors, and differentiated instruction when applied to gifted programs (Moon, 1996). It was originally designed as a pull-out program for a selected group of gifted learners identified through specific criteria such as IQ scores and achievement tests. This model provides a structured approach to differentiate instruction through three stages designed to increase responsibility and independence (Moon, 1996). Stage I: Development of Thinking Skills and Basic Content Acquisition is focused on developing cognitive skills such as critical thinking, creative problem solving, and research abilities. Teachers provide direct instructions to develop divergent thinking and convergent thinking, establishing a cognitive base for later stages. This stage also involves exposing students to various topics and disciplines to broaden their knowledge base and spark their interests. Stage II: Development of Creative Problem-Solving Skills is the stage where students engage in complex problem-solving tasks that encourage creativity, critical thinking, and the application of problem-solving strategies. The instruction with the teacher becomes more interactive and more of a facilitator and coach rather than direct instruction. Students are given opportunities to work on open-ended problems that require the use of research, collaboration, and innovative thinking. This stage is aligned with problem-based learning but tends to be more teacher-directed. Stage III: Independent Study involves the student performing authentic research. This final stage enables gifted learners to apply their accumulated skills and knowledge as independent investigators, typically focused on solving authentic, real-world problems. Gifted learners are encouraged to identify personally meaningful problems and design solutions, often involving self-directed research outputs or creative projects. The role of the teacher in this stage becomes a facilitator and resource provider, supporting learners towards autonomy and initiative.

This model operates on the premise that gifted students require systematic instruction in thinking skills, creative problem-solving, and research methodologies. The Purdue model underscores the importance of balancing instruction in basic skills with opportunities for creative expression and independent inquiry (Rawl & O'Tuel, 1983)It also adheres to the idea of scaffolding, where in early stages structured support gradually diminishes as students develop competence to act independently. The model emphasizes the significance of providing gifted students with opportunities to explore their interests and passions in-depth through long-term projects. Likewise, this model emphasizes the roles of teachers and students in the curriculum process.

The Purdue Three-Stage Model offers a structured approach to gifted education, systematically building cognitive skills and culminating in independent study (Moon et al., 1994). The model is comprehensive by systematically building cognitive skills in incremental stages. It utilizes a scaffolded approach where students receive intensive support in initial stages with a gradual release in later stages, which ensures competence in a safe manner. The model also balances skill-based direct instruction with opportunities to independently explore. However, the model has limitations. It requires intensive planning and resource allocation to implement, which can burden teachers. It is strictly designed for a pull-out program and may not be applicable in certain contexts. Also, it may not address affective and social-emotional needs of gifted learners, which could be addressed in other models (Moon, 1996).

Schoolwide Enrichment Model

The Schoolwide Enrichment Model (SEM) is a comprehensive approach to gifted education that aims to provide challenging, high-end learning opportunities for all students, not just those identified as gifted (Renzulli, 1999). It focuses on total school improvement by using talent and strengths among faculty, resources, and the student population (Renzulli, 1999). The model is designed to develop the strengths and talents of all students and provide opportunities for advanced learning experiences (Hernández & Saranlı, 2014). This is accomplished by providing enrichment opportunities for students in all areas of the curriculum, not just those traditionally associated with gifted education (Sytsma et al., 2003).

There are three goals of SEM. The first goal is to expand the talent pool in gifted programs (Renzulli, 2003). SEM is not limited to traditionally identified learners; instead, it provides enrichment opportunities to all students regardless of their ability level, while ensuring more advanced lesson options for highly motivated and talented individuals. The second goal is to make learning more engaging for learners by encouraging them to make choices and to construct relevant and meaningful projects for an authentic audience. The third goal is to increase academic achievement among all students through enhanced learning experiences in the classroom. The three goals of SEM can be met through three components: Type I Enrichment Activities, Type II Enrichment Activities, and Type III Enrichment Activities, which are under the tutelage of the Enrichment Triad Model (Reis & Peters, 2020).

There are three service delivery components under this model: total talent portfolio, curriculum modification and differentiation, and enrichment clusters. The Total Talent Portfolio is a tool that teachers use to identify the strengths and interests of their students (Göksu & Gelişli, 2023). This portfolio includes information about students' academic abilities, learning styles, interests, and talents. The Total Talent Portfolio helps teachers to differentiate instruction to meet the needs of all students (Renzulli & Renzulli, 2010)After identifying the strength and interest of the learner, curriculum modification and differentiation come in. It includes strategies such as curriculum compacting, tiered assignments, and learning centers to provide students with challenging and engaging learning experiences. Enrichment clusters are non-graded groups of students who share a common interest and work together on a project or activity. Enrichment clusters focus on the students' interests and pair students with a teacher facilitator who helps each student develop a product or service in an area of personal interest (Reis & Peters, 2020).

SEM also underscores the concept of a broad pedagogical approach, which uses strategies in gifted education to benefit all students, which may include problem-based learning and independent projects. It integrates acceleration, differentiation, and enrichment to enhance learning among students (Renzulli, 1999). Rather than serving the top 10% of the student population, SEM uses an inclusive talent pool where learners are identified through multi-criteria, including achievement, creativity potential, teacher nominations, and diverse pathways like self- or parent-nomination, allowing inclusion of those learners who are underachieving or twice-exceptional. SEM also stresses depth of understanding and complex thinking instead of superficial content coverage. Lastly, the model highlights its flexibility and adaptability in local contexts, which allows schools to tailor SEM to their unique needs and resources.

The model is rooted in the idea of the development of talent without total dependence on gifted program identification procedures. The SEM model emphasizes the importance of creating a challenging and engaging learning environment for all students and positively influences students' attitudes toward learning (Olenchak, 1990). It follows a strength-based approach that focuses on talent development by providing students opportunities to use their strengths and interests in the classroom (Renzulli & Renzulli, 2010). It promotes talent development for all students from various backgrounds and not just the identified gifted students (Renzulli & Renzulli, 2010).

The model provides an inclusive approach to gifted education and seeks to benefit all learners. It moves beyond the elitist notions of giftedness, enabling broader participation in enrichment and talent development. The model combines cognitive, creative, and motivational dimensions that support growth among learners. This model is also backed by research on its effectiveness on positive changes in student attitudes, creative productivity, and teacher practices across various cultural contexts (Subotnik et al., 2023). Likewise, the SEM works within the existing curriculum through modifications, compacting, and enrichment clusters instead of having separate gifted programs. Though the model is promising, there are some limitations to it. This includes sustainability on teacher commitment and buy-in to implement SEM components successfully. As some teachers may find it challenging to modify their teaching practices and curriculum (Renzulli, 1999). Balancing depth and breadth in the curriculum requirements also requires careful planning to ensure students still meet standards while pursuing independent projects. Lastly, it is necessary to provide training and professional development on SEM principles and strategies to enhance teacher buy-in and effectiveness.

Talent Search Model

The Talent Search Model (TSM) is a specialized curriculum model used as an approach to identify and foster academically gifted students by using above-level testing to accurately assess their advanced abilities and provide accelerated educational opportunities (Swiatek, 2007). The Talent Search Model is operationalized through a network of regional centers, primarily in the United States, where students are administered assessments designed for older age groups to reveal exceptional aptitude that might be masked by conventional, grade-level evaluations (Chan, 2015). The model uses traditional standardized achievement tests administered at a student's grade level that often fail to differentiate among highly gifted learners due to ceiling effects. The TSM addresses this by administering tests designed for older students (two or more grade levels above) to identify advanced reasoning abilities and subject matter aptitude (Chan, 2015). By identifying students with advanced academic potential early on, the TSM facilitates appropriate educational placements and interventions that match the student's learning pace and cognitive abilities. Those students who were selected through a talent search typically score at or above the 95th percentile on grade-level standardized achievement tests, and this criterion allows for the identification of students who have already mastered much of the standard curriculum. The model highlights prescriptive educational interventions where educators analyze what students do not know from above-level testing and design instruction targeting those gaps, allowing for a more tailored acceleration and enrichment. Accordingly, programming may include advanced coursework, mentorships, specialized workshops, and research opportunities that extend beyond the regular school curriculum.

The model exhibits a ceiling effect problem recognition, which means that standardized tests meant for grade level may not accurately determine the academic ability of learners. The model also employs domain-specific assessments, allowing for the identification of talent in particular subjects like mathematics, science, and verbal reasoning (Olszewski-Kubilius, 1998). The model also emphasizes early identification of talent so that timely interventions and educational opportunities can be provided to maximize potential. Likewise, the identification process is linked with programming, where identification becomes meaningful when it informs academic placement and services. Lastly, the model stresses educational acceleration, where students are provided with opportunities to advance through the curriculum at a pace commensurate with their abilities, often bypassing traditional grade-level constraints (VanTassel-Baska & Brown, 2007).

The TSM provides accurate identification of giftedness that leads to appropriate educational placements that stimulate gifted youth. The above-level testing helps avoid misclassification or under-identification of gifted students by overcoming ceiling effects inherent in common testing. The model provides actionable data that informs educational placement and services for the gifted learner based on the results of the tests. However, there are some challenges involved with this model. The conduct of above-level testing requires access to appropriate tests, trained personnel, and follow-up programming resources. The model is also limited by the scope of its testing instruments, where if focus remains primarily on cognitive abilities measured through standardized tests, potentially overlooking other facets of giftedness, such as creativity, leadership, or artistic talent. Although more advanced, testing still reflects a narrow range of abilities and may miss some students with nontraditional learning profiles (Johnsen, 2024).

Grid: The Depth and Complexity Model

The Depth and Complexity Model by Sandra Kaplan is an integrated curriculum and teaching model designed to challenge gifted students by prompting them to explore topics through multiple perspectives and higher-order thinking skills (Kaplan, 2007). This model uses a framework incorporating various elements of depth and complexity that encourages students to explore subjects in greater detail and from different viewpoints (Göksu & Gelişli, 2023). The model focuses on depth, which refers to how far one explores a topic, while complexity refers to how different elements are related to one another. The elements include language of the discipline (specialized vocabulary and technical terms), details (attributes, parts, and factors related to the topic), patterns (recognizing repetition, sequences, or predictability), rules (structures and heirarchy), ethics (conflicting position, moral implications, or judgment), unanswered questions (gaps and discrepancy), and big ideas (generalization and principles) (Ronksley-Pavia, 2010). These elements act as lenses through which students examine topics, fostering more sophisticated comprehension. Complexity involves examining topics from multiple perspectives and angles, such as considering various viewpoints, understanding relationships, and evaluating interconnections. The model also supports curriculum differentiation by allowing teachers to modify the content, instructional process, and products, allowing learners to access content based on their readiness levels, interests, and learning profiles (Azano et al., 2017). In effect, teachers can use the Depth and Complexity Model to modify various components of the curriculum (Ronksley-Pavia, 2010).

The model operates on the idea that curriculum for gifted learners must go beyond standard grade-level content by delving deeper into subjects and exploring their multifaceted nature (Azano et al., 2020). The model encourages abstract and critical thinking by encouraging students to analyze, evaluate, and synthesize information rather than merely memorizing facts. It also emphasizes the significance of critical and creative thinking by encouraging questioning, investigation, and the construction of personal meaning from the subject matter. Finally, it recognizes that gifted students require ongoing opportunities for intellectual challenge that incorporates depth and complexity towards fostering continuous learning.

The Depth and Complexity model provides a framework for curriculum differentiation where teachers can adapt the curriculum to address the varied requirements and interests of gifted students while fostering personalized learning experiences. It basically enhances critical and creative thinking skills that help students move beyond surface-level learning. It uses visual icons that represent each element of depth and complexity that may assist students in understanding and interacting with complex concepts. It also promotes engagement and motivation by challenging learners to uncover unanswered questions and explore alternative viewpoints, which fosters an increased intellectual curiosity. However, the model can be difficult to implement effectively without professional development and continuous assistance for educators on how to efficiently include depth and complexity components. Learners who are also not familiar with this model may require some time to adjust to the model's framework and expectations, especially when it comes to autonomous learning.

Multiple Menu Model

The Multiple Menu Model (MMM) provides a framework for teachers to design differentiated curricula that cater to the diverse needs of gifted students (Renzulli, 2023). The model believes that the curriculum for the gifted is equal to the body of knowledge (knowledge menu) plus the instructional techniques. The model focuses on offering students choices and options in their learning experiences by integrating a range of activities, resources, and assessment methods that cater to various learning styles, interests, and talents. The curriculum emphasizes cognitive and affective development by incorporating activities that promote critical thinking, problem-solving, creativity, and social-emotional growth. At first, the curriculum designer must decide on the knowledge menu, the desired discipline or unit the learners should study. This knowledge menu operates under two key assumptions: first, it acknowledges the impracticality of comprehensively teaching every aspect of a discipline, and second, it emphasizes the necessity of inquiry. The Knowledge Menu, which is the initial menu, requires curriculum developers to systematically review a discipline from four distinct angles: its purpose and positioning within the broader framework of knowledge, its concepts and guiding principles, its most illustrative topics and significant contributions to the collective understanding and wisdom, and its established methodology (Renzulli et al., 2000). This approach guarantees that the curriculum is well-organized and adjusted to the unique learning requirements of gifted students (Renzulli, 1999).

Instructional techniques cover four menus, such as the instructional objectives and student activities menu, the instructional strategies menu, the instructional sequence menu, and the artistic modification menu. The Instructional Objectives and Student Activities Menu enables teachers to differentiate learning experiences based on individual student requirements and interests. It outlines varied ways a student can learn, retain, analyze, synthesize, and apply knowledge. Teachers can use this menu to create activities that are specifically designed to address various learning preferences and skill levels. The Instructional Strategies Menu promotes active learning and engagement, which is crucial for gifted students, by providing teachers with a wide array of research-backed teaching strategies to pick from (Hu et al., 2016). It specifies what students do during learning, promoting active involvement and hands-on inquiry. The Instructional Sequence Menu assists teachers in sequencing learning experiences to maximize student comprehension and retention and offers a structured framework for planning lessons and units. Finally, the Artistic Modification Menu guides teachers in including creative and artistic elements into the curriculum, which can improve learning and engagement for gifted students. These menus are all connected with an end goal to produce concrete or abstract products from the instructional products menu. Concrete products include knowledge, written, spoken, and constructed products. It may also be an artistic performance or a leadership behavior. While abstract products may include cognitive structures, problem solutions, strategies, values, appreciations, and self-actualization (Renzulli, 2023).

This model emphasizes the creating of selections and options in learning experiences and enabling gifted learners to select activities, resources, and evaluation methods that are consistent with their interests, learning styles, and talents. It supports the adaptation of content, process, and products to meet students' diverse interests, readiness, and skill levels. Furthermore, it cultivates sophisticated cognitive processes, inventive problem-solving capabilities, and refined research techniques, thereby presenting continuous intellectual stimulation for students (Renzulli, 1992).

The model provides gifted students with enhanced autonomy and ownership over their education by providing chances for choice and self-direction. Its menus are structured to cover all aspects of curriculum development, from content selection to product creation. It emphasizes student inquiry and producing meaningful and deep learning. The menus provide a rich array of choices that may be suited to all grade levels, content areas, and learner profiles, enabling a more precise differentiation for teachers to plan. However, teachers may need substantial time and resources to effectively use the model because of the wide variety of materials, activities, and evaluations that must be created. The model is not a prescriptive curriculum; rather, it is a planning framework for curriculum developers and implementers. It requires a careful balancing act of choice, structure, and teacher guidance to ensure students are challenged and supported.

Integrated Curriculum Model

The Integrated Curriculum Model (ICM) is specifically designed to address the unique needs of gifted learners, focusing on providing them with advanced content, higher-level thinking skills, and opportunities for in-depth exploration of interdisciplinary concepts (Göksu & Gelişli, 2023). This model is a research-based curriculum framework that promotes deeper understanding of concepts by linking them across multiple disciplines (VanTassel-Baska & Wood, 2009). There are three core components of the ICM, this includes concepts, issues, and themes dimension, advanced content dimension, and process/product dimension. The concepts, issues, and themes dimension refers to the broad, interdisciplinary themes and ideas that connect learning across multiple content areas. The Advanced Content Dimension refers to the inclusion of complex, abstract, and accelerated content that goes beyond the typical grade-level curriculum. This component allows students to engage with rigorous and challenging material that expands their knowledge and understanding. The process/product dimension emphasizes the development of higher-order thinking skills such as critical thinking, problem-solving, and creative expression through student-driven projects and investigations. Students engage in inquiry-based activities, conduct research, and create original products that demonstrate their learning (VanTassel-Baska & Wood, 2009). This model promotes learning that crosses traditional subject boundaries, rather it encourages students to examine topics from various lenses, enabling them to recognize complicated linkages and patterns (Vidergor, 2010).

The model is theoretically supported by major theories. The first source is the work of Vygotsky, specifically on his three theoretical orientations. First, his idea about the zone of proximal development; second, his emphasis on qualitative differences in learning; and third, his explanation of the role of cultural tools in mediating and advancing cognition (VanTassel-Baska & Wood, 2009). The second theoretical basis is James Banks' research on multicultural education, which focuses on how diverse cultural perspectives may increase comprehension of key principles and concerns. This model underscores that it is not meant for remediation but for enriching and extending gifted student learning. Like any other model, it promotes a curriculum that develops higher-order thinking skills (Ronksley-Pavia, 2010).

The integrated model focuses on fostering critical thinking, problem-solving abilities, and creativity through the use of real-world issues and challenges. The interdisciplinary nature of this model fosters a more profound comprehension of the interconnections between different academic fields, promoting holistic learning experiences (VanTassel-Baska & Wood, 2009). This model enhances students' abilities to apply knowledge across various contexts and promotes a more complete comprehension of the world. However, a possible drawback is the substantial need for teacher training and cooperation to ensure proper interdisciplinary integration. Teachers must work together to align course objectives, create common assessments, and deliver interdisciplinary content in a coherent way. Teachers may find it difficult to locate and compile the relevant resources needed to support the model because it calls for in-depth subject knowledge and the capacity to make connections between different disciplines.

Talents Unlimited Model

The Talents Unlimited (TU) Model is a research-based, comprehensive framework created to enhance students' thinking abilities, promote creativity, and increase problem-solving skills across a variety of subjects and grade levels (VanTassel-Baska & Brown, 2007). Developed by Carol Schlichter in the 1970s, this model was influenced by the works of Gardner, Taylor, and Sternberg. The TU model is a whole-school approach to talent development.

The model allows students to develop six areas of thinking or talents, these include productive thinking, decision-making, planning, forecasting, communication, and academic talent. Productive thinking is the capacity to create original ideas, foresee possibilities, and approach problems in novel ways. Decision-making is the capacity to evaluate possibilities, take into account pertinent information, and choose the best course of action, which is essential for problem-solving and critical thought. Planning includes setting goals, spotting resources, and arranging steps to successfully complete tasks or projects, encouraging foresight and organization. Forecasting entails anticipating outcomes, predicting trends, and making educated guesses based on existing data or trends, promoting analytical and strategic thought. Communication helps students successfully articulate

ideas, convey information, and engage in conversation with others, therefore promoting teamwork and interpersonal skills. Academic Talents shows aptitude in conventional academic areas like reading, writing, math, and science, laying the groundwork for lifelong learning and academic achievement. These thinking skills are developed and applied in all areas of the curriculum.

As a whole school model, it trains all teachers as talent scouts, enabling them to identify and develop multiple talents in all students (VanTassel-Baska & Brown, 2007). Teachers are trained through in-service programs to become talent scouts, which enables them to discover and cultivate a variety of talents in all of their students. The programs are focused on theory, modeling of creative and critical thinking strategies, classroom practice, feedback, and coaching to ensure effective instructional implementation. The model also uses multiple modes of student expression (Reis & Peters, 2020). Students may show their knowledge and abilities via writing assignments, oral presentations, artistic creations, visual displays, dramatic performances, computer programs, games, construction projects, or service projects.

At its core, the Talents Unlimited Model operates on several fundamental principles, which include all students possessing multiple talents. First, the model believes that thinking skills are teachable and developable. This means that higher-order thinking abilities can be systematically taught and enhanced. It also adheres to the idea that success and gifted behaviors can manifest in diverse ways, thus broadening the scope of what constitutes talent (Bailey & Morley, 2006). This model also underscores the role of the teacher as talent scouts who are actively looking for and fostering multiple gifted behaviors.

The TU model develops diverse talents as it addresses a spectrum of talents beyond academics, preparing students for a more well-rounded development. Also, TU promotes equity and inclusion, creating equal opportunities for all students to cultivate their talents. The comprehensive in-service training support for teachers in becoming talent scouts improves teacher capacity to effectively deliver gifted services. However, this capacity building may also become a drawback, as it requires a huge amount of investment, as well as ongoing support and resources for effective integration. The model also has a broad focus on thinking, which does not always provide explicitly advanced content acceleration for some highly gifted students.

Discussion

The curriculum models in gifted eeducation are operationalized in diverse educational setting with various means of service delivery. Ranging from pull-out programs to whole-school transformations, each model reflects different psychological principles, and resource allocations. The Purdue Three-Stage Model is designed to be implemented through a pull-out programs, emphasizing enrichment and acceleration within specific academic domains. Similarly, the Talent Search Model operationalizes through regional centers or specialized schools established to develop talents using above-level testing, facilitating student placement in accerelerated and nurturing educational opportunities outside the classroom. Meanwhile, the Schoolwide Enrichment Model and the Talents unlimited Model are curriculum frameworks that are designed for whole-school inclusive models. As these models emphasizes broad pedagogical approaches and school-wide policies that enrich the learning environment for all students regardless of whether they are gifted or not (Pahrudin et al., 2024).

A critical pattern observed is the varying emphasis on the *process* of learning versus the content itself. Models like the Talents Unlimited Model and Grid: Depth and Complexity Model primarily focus on developing thinking skills, creative problem-solving, and critical inquiry (process), whereas the Integrated Curriculum Model (with its Advanced Content Dimension) and the initial stages of the Purdue Three-Stage Model (content acquisition) place more emphasis on the subject matter. This distinction highlights a fundamental divergence in pedagogical philosophy: some models prioritize the cultivation of metacognitive abilities applicable across disciplines, while others advocate for deep dives into specific content areas to foster expertise (Subotnik et al., 2023). Another growing consensus across models, particularly evident in the Autonomous Learner Model, Enrichment Triad Model, and Multiple Menu Model, is the importance of fostering student autonomy, choice, and self-direction. Empowering gifted learners to pursue their interests and manage their learning enhances engagement

and motivation, leading to more meaningful learning experiences. Furthermore, effective practices in gifted education frequently incorporate research-supported strategies, with enrichment and acceleration approaches being the most commonly utilized, although acceleration generally exhibits stronger empirical backing, particularly in subjects like mathematics, due to the objectivity of variables enabling robust quantitative research designs (Reis & Renzulli, 2003).

A systematic review by García-Martínez et al. (2021) found a wide variety of didactic strategies and models for gifted students, echoing the diversity identified in this study. However, they noted a significant lack of pre-post methodological designs focusing on performance, indicating a continued need for rigorous empirical research on the direct impact of specific model. The efficacy of these curriculum models, while conceptually sound, often lacks substantial empirical evidence demonstrating their direct impact on student outcomes (Oh et al., 2012). While some models, such as the Feldhusen, Renzulli, Schlichter, Stanley, Sternberg, and VanTassel-Baska models, have demonstrated some evidence of effectiveness with gifted populations compared to alternative or no treatments, the translation of these theoretical curriculum models into consistently effective practical applications varies considerably (VanTassel-Baska & Brown, 2007).

Peters (2021) critically discusses the persistent struggle with racial, ethnic, socioeconomic, and disability inequity in K–12 gifted programs. This concern is directly addressed by inclusive models like SEM (Brulles & Winebrenner, 2011), which aim to broaden participation (Reis & Peters, 2020). Ford et al. (2021) further emphasize the need for culturally responsive approaches to meet the academic, cultural, and psychosocial needs of underrepresented students, suggesting that models prioritizing flexible identification and diverse talent development are crucial. Moreover, Hertzog et al. (2023) highlight ongoing school district initiatives aimed at improving access to advanced learning opportunities, reflecting the practical efforts to address these inequities. Andini et al. (2020) also emphasize curriculum adaptation for diverse students in inclusive classrooms. Such adaptations are vital for ensuring that gifted education remains accessible and effective for a heterogeneous student population, encompassing various learning styles and cultural backgrounds.

Effective implementation of any sophisticated curriculum model for gifted learners hinges on well-trained teachers (Cheung et al., 2022; Wycoff et al., 2003). The transition from traditional teaching roles to facilitators and mentors, as required by models like ALM, demands significant professional development and ongoing support. Studies show that while training can increase knowledge, it may not always shift fundamental beliefs or sustained practice (Brigandi et al., 2019). Therefore, professional development must be continuous, practice-oriented, and address underlying pedagogical philosophies.

CONCLUSION

The comparative analysis of curriculum models in gifted education highlights a nuanced landscape where effective pedagogy spans a continuum from deep enrichment (e.g., Schoolwide Enrichment Model, Enrichment Triad Model) to targeted acceleration (e.g., Talent Search Model), all striving to cultivate advanced cognitive, creative, and socio-emotional development. A core argument emerging across these diverse frameworks is the imperative for highly differentiated instruction, fostering learner autonomy, and a critical shift towards inclusive talent development that benefits a broader student population, thereby addressing long-standing equity concerns. However, the successful implementation of these models is consistently challenged by significant resource demands, the need for substantial teacher expertise, and persistent inequities in identification, particularly for underrepresented populations. Additionally, the selection of appropriate curriculum model must be based on the individual needs of the gifted student and the specific educational context, rather than a one-size-fits-all approach (Pahrudin et al., 2024). The decision to adopt a particular model must also be predicated on a thorough assessment of institutional capacity, educator preparedness, and the specific learning profiles of the student cohort (VanTassel-Baska & Brown, 2007). Therefore, for educators and policymakers, practical recommendations include prioritizing robust and sustained professional development, adopting multi-criteria identification practices, integrating socio-emotional learning, and strategically leveraging technology to enhance accessibility and customization. Future research should focus on conducting rigorous longitudinal evaluations of these

models' outcomes and exploring culturally responsive adaptations to ensure equitable access and sustained positive impact for gifted learners across diverse global contexts.

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