education sciences

MDPI

Review

Transforming Gifted Education in Schools: Practical Applications of a Comprehensive Framework for Developing Academic Talent

Rena F. Subotnik [1,*], Paula Olszewski-Kubilius [2], Susan Corwith [2], Eric Calvert [2] and Frank C. Worrell [3]

[1] Academic Talent Development Program, University of California, Berkeley, CA 94720, USA
[2] Center for Talent Development, Northwestern University, Evanston, IL 60208, USA; p-olszewski-kubilius@northwestern.edu (P.O.-K.); s-corwith@northwestern.edu (S.C.); eric.calvert@northwestern.edu (E.C.)
[3] Berkeley Graduate School of Education, University of California, Berkeley, CA 94720, USA; frankc@berkeley.edu
* Correspondence: subotnik0@berkeley.edu

Abstract: The foundation for talent development as a framework for gifted education can be found in a synthesis of the psychological literature on creativity, eminence, giftedness, and high performance. The talent development framework acknowledges the contributions of both general cognitive ability and domain-specific abilities to achievement, as well as the malleability of these ability constructs. Talent development is also consistent with research on the contributions of non-cognitive or psychosocial factors to school achievement, as well as studies on factors that influence the attainment of scholarly productivity and artistry within specific domains of non-academic talent. Although there are several theoretical frameworks and models of giftedness, talent development, ability, and intelligence, each with varied areas of emphasis and desired outcomes, the research base and practical applications for the talent development megamodel (TDMM) can serve as a guide to leaders and school administrators in making fiscal and programmatic decisions that maximize short- and long-term impacts for individuals and society. In this article, we discuss some of the practical implications of the model for assessment, curriculum and instruction, and psychosocial development within a school context.

Keywords: talent development; domain-specific abilities; domain trajectories; psychosocial skills; high performance; gifted education

check for updates

Citation: Subotnik, R.F.; Olszewski-Kubilius, P.; Corwith, S.; Calvert, E.; Worrell, F.C. Transforming Gifted Education in Schools: Practical Applications of a Comprehensive Framework for Developing Academic Talent. *Educ. Sci.* **2023**, *13*, 707. https://doi.org/10.3390/educsci13070707

Academic Editors: Kirsi Tirri and Valerie Margrain

Received: 31 May 2023
Revised: 6 July 2023
Accepted: 7 July 2023
Published: 12 July 2023

Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Talent development, as a framework for gifted education, is gaining traction among scholars and practitioners. Its foundation can be found in a synthesis of the psychological literature on creativity, eminence, giftedness, and high performance [1]. The talent development framework acknowledges the contributions of both general cognitive ability or intelligence and domain-specific abilities to achievement, as well as the malleability of these ability constructs [2–4]. Talent development is also consistent with research on the contributions of non-cognitive or psychosocial factors to school achievement [5,6], as well as studies on factors that influence the attainment of scholarly productivity and artistry within specific domains of non-academic talent [1,7]. Talent development is attractive to practitioners because it is easier to conceptualize talent in specific areas (e.g., mathematics, language) than the abstract concept of giftedness based on general cognitive ability, and it is also easier to address instructionally. Importantly, this framework puts a greater focus on the development of emergent talent and potential, which offers more opportunity and direction to educators and teachers to address the needs of a wider range of learners, including minoritized groups of students.

Although there are several theoretical frameworks and models of giftedness, talent development, ability, and intelligence, each with varied areas of emphasis and desired outcomes, the talent development megamodel (TDMM) is one of the most comprehensive and "the most explicit in stating that giftedness starts as potential in all domains and, with opportunity and psychosocial skills, can be developed into competencies, expertise, and scholarly productivity and artistry" [8] (p. 358). The TDMM emphasizes the provision of systematic and continuous academic opportunities for growth across the lifespan, as well as the introduction of psychosocial skills such as taking on challenges and setbacks associated with creative growth [6]. Its research base and practical applications can serve as a guide to leaders and school administrators in making fiscal and programmatic decisions that maximize short- and long-term impacts for individuals and society. In this article, we discuss some of the practical implications of the model for assessment, curriculum and instruction, and psychosocial development, within a school context.

2. The Talent Development Megamodel

The TDMM is broadly applicable across diverse domains, including academics, athletics, visual and performing arts, and professions. In the context of education, specifically the field of gifted education, the authors of the megamodel proposed that outstanding achievement or scholarly productivity and artistry ought to be the main goal of gifted education [9] because "aspiring to fulfill one's talents and abilities in the form of transcendent creative contributions will lead to high levels of personal satisfaction and self-actualization as well as produce yet unimaginable scientific, aesthetic, and practical benefits to society" [1] (p. 3).

Having outstanding achievement as a goal does not mean that schools should focus attention only on those students deemed capable of reaching the highest levels of achievement, which is not even possible to do. This goal means that schools should focus on preparing students with the content knowledge and psychological skills that will enable them to take full advantage of presented opportunities and reach the levels of achievement they desire and are capable of, including the highest levels. Paths towards high achievement begin with nurturing talent from early childhood and continuing through adulthood through school-based and supplemental programs that balance challenge (academic content and skills) and support (psychological skills).

The major tenets of the TDMM are presented in Figure 1. The TDMM emphasizes the deliberate cultivation of ability in specific domains and yields a framework for designing educational programs and services that address academic content and skills, psychosocial skills, and psychosocial needs at each stage of talent development. It is grounded in the idea that talent development occurs over time and that a young person's learning needs, growth trajectory, and domains of ability vary, necessitating a range of rigorous enrichment and accelerated learning and support services, including academic planning and career counseling. This range of services must be articulated—systematically and continuously—to help as many young people as possible reach their full potential.

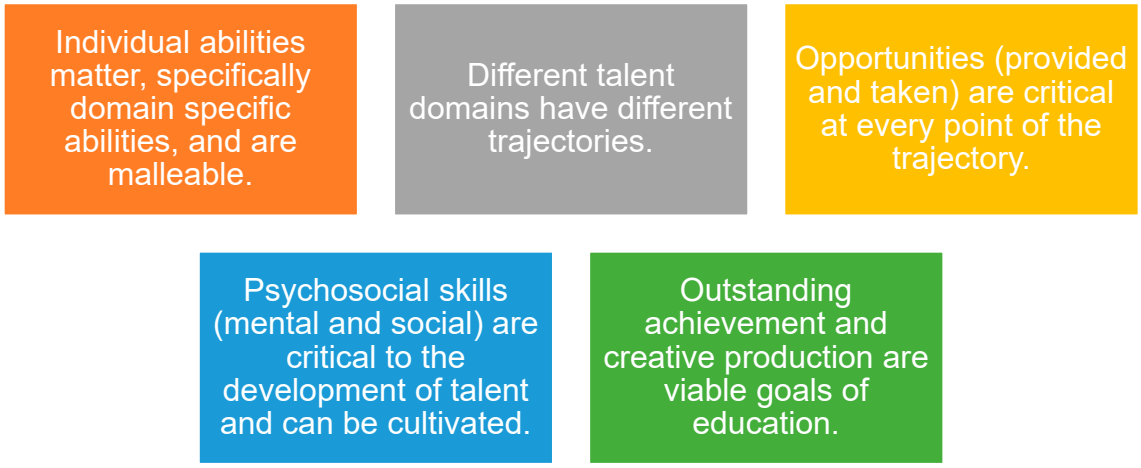


Figure 1. Tenets of the talent development megamodel.

3. Implications of the Talent Development Megamodel for Educational Programming

Rather than focusing solely on the mastery of a set curriculum or assuring basic knowledge of core subjects, education using a talent development approach aims to provide authentic experiences in specific domains, attending to individuals' interests and strengths [10], as well as the different timing of different domains. Early learning experiences expose young people to a variety of subjects, often using an interdisciplinary approach, and they are designed to pique sufficient interest to maintain a commitment to building domain-relevant skills and knowledge that takes place at the next stage, enabling learners to advance at a pace and level commensurate with their abilities. Additionally, engagement with real-life problems and projects nurtures motivation, self-efficacy, and persistence, and serves to assuage young people's need for control over a rapidly changing environment [11]. Programming at the later stages of talent development connects students to domain professionals and experts to build a scholar identity, impart knowledge about career and educational paths, and begin to cultivate a supportive network. In sum, talent development programming aligns with readiness and interests, and it includes a focus on short- and long-term goals.

There are several advantages of adopting a talent development model for school programming. First, introducing children to the specific abilities and skills associated with domains helps them become ready for enrichment and accelerative opportunities and to maximize their learning. It also promotes a growth mindset and encourages motivation and academic risk taking. These early experiences are especially critical for children who have fewer opportunities for formal learning in their early environments and can enable children to "catch up" in their achievement and demonstrate their learning potential to teachers [12]. Second, providing domain-specific activities and enrichment programming can assist in identifying children's potential more effectively than relying on general ability measures or achievement scores. While keeping options open for a change in direction, identifying and defining pathways allows students to reach higher levels of achievement in their areas of interest and strength.

Third, balancing the acquisition of content knowledge and skills with the development of psychosocial skills necessary for high performance helps young people learn the skills needed to persist in the face of difficulty and fears, eventually propelling them to higher levels of achievement and creative productivity in adulthood. Fourth, meeting the needs of a larger range of students—that is, both those with emerging talent and those already demonstrating advanced achievement—creates broader access to opportunities for growth and improvement. Finally, a talent development approach gives more students from diverse backgrounds the opportunity to embark on paths toward eminent levels of achievement, helping to address the equity concerns associated with traditional gifted education.

4. Components of Talent Development Programming

Consistent with the tenets of the TDMM presented in Figure 1 [13], there are several components of a comprehensive talent development program. These can be grouped into six main categories for the purposes of planning and evaluation. These include (1) focusing on domain-specific knowledge and skills, (2) considering domain-specific trajectories, (3) recognizing that abilities are not fixed and need to be developed, (4) teaching psychosocial skills, (5) planning for academic and career pathways, and (6) taking advantage of opportunities when they present themselves.

4.1. Focus on Domain-Specific Knowledge and Skills

In the TDMM, general ability is considered foundational to the development of more specific, domain-relevant abilities such as mathematical, verbal, or spatial abilities [1,14,15]. However, in contrast to traditional gifted education models, measures of general cognitive ability may have limited utility to identify learners with advanced potential for domain-specific talent development opportunities (e.g., advanced mathematics courses). Rather, in a talent development approach, measures of specific abilities should be used that can reveal the relative strengths of each student in order to guide them toward engaging and appropriately challenging courses and programs that capitalize on and further develop their particular profile of abilities.

Research supports the importance and predictive validity of domain-specific abilities for achievement. Studies have shown, for example, that a verbal versus quantitative tilt in abilities—that is, high scores on tests of verbal versus mathematical reasoning ability in middle school students—is related to differences in domains of adult accomplishment. Typically, verbal tilt increases the probability of accomplishments in the humanities and quantitative tilt increases the probability of accomplishments in STEM fields [16,17]. Moreover, not only do domain-specific abilities matter, but the pattern of abilities is useful in determining future educational and career paths for students. For example, high mathematical ability along with high spatial ability is associated with success in STEM fields, particularly engineering and physics [18]. More unique factors associated with an academic subject like mathematics, such as number sense or mathematical cast of mind, have accumulated a large quantity of supporting literature [19–22]. Other subjects need this level of detailed research to expand the possibilities of identifying potential abilities.

From the talent development perspective, general ability can be an initial indicator of talent and academic potential, while domain-specific academic abilities become increasingly important as abilities naturally differentiate with development. Many students are outstanding academically but have not identified a domain of special interest. Measures of general ability can be useful to educators as they can reveal the necessity for a faster pace of learning, and, combined with achievement indices, highlight the potential for grade or subject area acceleration before students' interests coalesce or for those talent domains that emerge later (e.g., psychology or leadership). Providing the appropriate level of challenge through pacing and advanced content will keep students engaged in learning and help them develop important psychosocial skills such as a growth mindset or presentation and study skills so that students are prepared to take advantage of opportunities in the domain that eventually emerges as a good fit with their interests and abilities.

4.2. Different Domains Have Varied Trajectories

Because of its emphasis on domain-specific abilities, the TDMM acknowledges that various academic fields have unique trajectories [1,15]. Some domains can be introduced very early in a child's academic or home experience as part of the building blocks to other domains or because they are developmentally appropriate and accessible through daily activities—mathematics, some musical instruments such as violin, or some sports such as gymnastics—whereas other domains may not become known, at least in depth, until schooling during late adolescence or even university (see Table 1). This can relate to the

level of prerequisite knowledge and skills (e.g., leadership, philosophy) needed or even physical development required.

Table 1. Domain trajectories.

Domain	Childhood	Adolescence			Adulthood		
		Early	Mid	Late	Early	Mid	Late
Music							
Violin	Start						End
Vocal Arts				Start			End
Athletics							
Gymnastics	Start			End			
Football		Start				End	
Academic							
Math	Start						End
Psychology				Start			End

Mathematics, for example, lends itself to early precocity, and children can begin formal study at the start of school or even earlier. Other areas, such as psychology or history, require a longer period of building foundational knowledge and skills, including analytical writing and critical reading, such that serious study can only begin much later, for example, at secondary school or college [1,14]. Of course, access to certain subjects is controlled by the structure of current schooling, which typically and somewhat arbitrarily limits students' access to subjects such as psychology until high school, or philosophy or engineering until college. These unique trajectories influence when identification should occur and when programming might begin for different academic subjects.

Factors such as access to opportunity have an impact on talent development trajectories. For example, some children start formal education having had considerable exposure to books, music, mathematics, and science from their early environments. They are ready to start with an advanced curriculum and accelerated placement in schools and supplemental programs, sometimes in settings with older learners. Other students, particularly those from more economically disadvantaged backgrounds, may have exceptional learning potential that is not obvious or demonstrated through advanced knowledge or school achievement because of a lack of early stimulation and exposure. These children can benefit from early enriched instruction and curricula to both nurture and reveal their potential, followed by subsequent opportunities to access high-level courses and programs and/or accelerated placements.

4.3. Abilities Can Be Developed

In the traditional gifted child approach, exceptional ability and/or high intelligence are viewed as all-or-none traits of an individual—"you have it or you don't" [23,24]. From the talent development perspective, individual differences in initial abilities are recognized; however, these abilities are not static and need to evolve over time. In its earliest manifestation, talent is best described as potential for future achievement in a domain. As children develop and grow—and with nurturance, opportunity, effort, study, and practice—potential is developed further into competence and expertise that is increasingly demonstrated in exceptional levels of creative achievement. The pinnacle of talent development, typically achieved in adulthood, is the generation of a transformative idea or performance [1,14].

When creating programs that support talent development, the first step is to select the domains in which opportunities will be provided, including the distinction between the development of performers (e.g., actors, singers, athletes) and producers (e.g., composers, writers, scientists) [1]. The next step, which is the responsibility of the research community working in collaboration with domain experts, is to identify the knowledge and skills necessary for achievement at the highest levels in each domain, which requires working with professionals and domain experts. This step may include making explicit what is often viewed as implicit knowledge shared among those with expertise and experience.

With the knowledge of what is required at the highest levels, educators can then develop an articulated sequence of programs within domains that will enable students to progress through the stages of talent development that their school serves, which is typically moving potential through competence or early expertise.

For children and adolescents, academic domains can be introduced within generalized areas of study and become more specialized with interest and achievement. There are several implications for school-based programming: If an ability can be developed, then it must be cultivated continuously (exposed, observed, assessed). If learning is contextual, then looking for evidence of ability outside of school and typical classroom environments is important. For example, relationships with community organizations such as clubs, museum classes, or scouting can allow for the cultivation of special abilities such as leadership. If psychosocial skills matter, then designing opportunities for coaching and practice can be integral parts of the talent development program.

4.4. Psychosocial Skills Are Critical to Talent Development

Psychosocial skills are those that enable a person to marshal environmental, social, and technological resources deliberately, ethically, and productively in the service of attaining goals. These include the skills typically grouped under social and emotional learning (e.g., self-awareness, social awareness, self-management), but also include a much broader range of constructs. In the TDMM, psychosocial skills are considered essential for transducing ability and potential into creative productivity in adulthood, with certain skills being more important at particular stages of talent development [25,26].

Research has shown that psychosocial skills, such as growth mindsets, self-regulation, and self-efficacy, have become increasingly critical determiners of whether students progress to higher levels of talent development, and that these skills can be taught and developed by instructors and other adults [1,27]. However, which psychosocial skills are important vary with the stage of talent development. For example, growth mindsets that emphasize the role of effort and practice on achievement, and teachability, which involves being open to instruction and feedback, are critical when children are learning the foundational techniques and knowledge of their talent field. However, independent thinking, confidence to challenge and question instructors, and knowing one's strengths and weaknesses become important when individuals are more advanced in their fields [7]. The talent development framework emphasizes the deliberate cultivation of psychosocial skills that support high achievement, rather than leaving these to chance.

Specialists and others can help children acquire these psychosocial skills by building their development into programming and curricula and through their interactions with students [5]. For example, teachers can make sure they convey, through their verbal messages to children and feedback on projects and assignments, the importance of effort and study, as well as the practice of a variety of learning strategies. Dweck [28] proposed some recommendations for the kinds of praise that promote malleable, as opposed to fixed, mindsets in children. Educators can provide opportunities for children to take intellectual risks, such as projects that are difficult and require them to work on the edges of their current competency level, or ones that allow them to put novel ideas forward in a supportive context. Educators can provide emotional scaffolding to gifted children at critical transition points, such as when they move to more challenging and competitive academic environments and assist parents in learning how to support their child at home during these times. It is also key that educators model resiliency and strategies to cope productively with perceived failures, setbacks, and threats to self-esteem and confidence [14,26].

A second category of psychosocial skills comes from the world of performance, where these skills are used to enhance the effectiveness of elite athletes or musicians [29]. These skills, such as addressing performance anxiety, screening out distractions, and strategic risk taking are also useful for academic environments that include presentations, competitions, and critical examinations. Academic talent development mirrors music and sports performance psychology in recognizing that the ability to engage in ongoing deliberate practice in

"low stakes" situations and the ability to self-regulate mental focus and emotional arousal in high-stakes situations are critical for long-term success and peak performance. Explicitly drawing these connections for students and teaching concepts that are transferable across multiple talent domains may be effective strategies to increase academic achievement and improve performance in other areas [30].

Parents and teachers can facilitate the development of the skills needed at each stage of talent development (Figure 2) with proper training and access to the right resources, keeping in mind that, in order for students to acquire self-regulation learning strategies, they must be taught them explicitly; moreover, they must practice them in relevant domain-specific learning contexts using content that is appropriately advanced [31] (Zeidner and Stoeger, 2019).

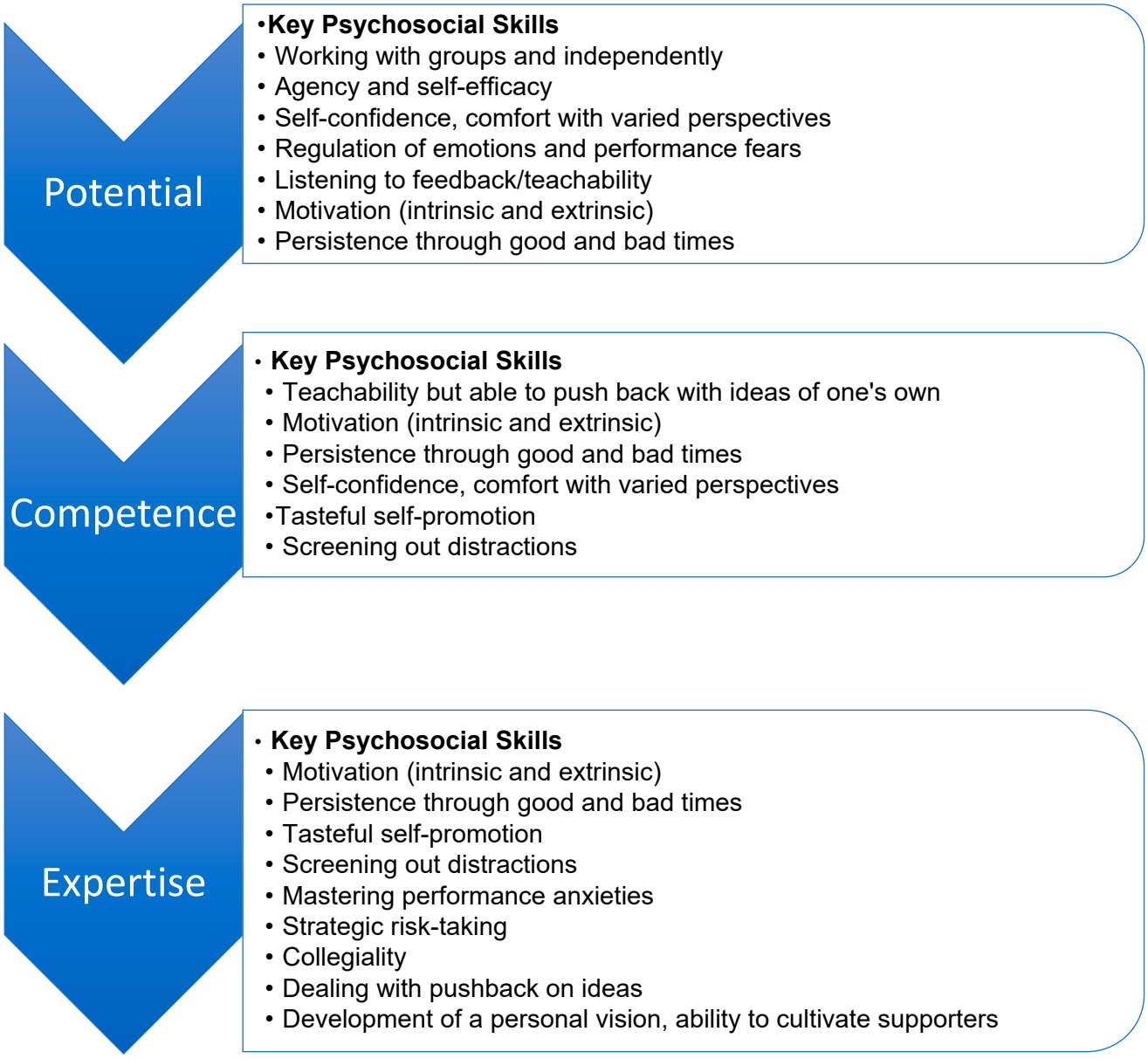


Figure 2. Transition from psychosocial skills to high-performance skills over time.

4.5. Planning for Academic and Career Pathways

Young people need help in identifying and attaining academic and career goals and access to insider knowledge about careers and educational paths from professionals in

the field. This process starts with the ability to recognize their interests, strengths, and needs in cognitive and psychological areas. This is followed by an awareness of domains of study and related professions that align with these interests, strengths, and needs. In addition, insight into how one learns and the influence of culture, traditions, values, and opportunities, as well as insider knowledge about careers and educational pathways, is often learned implicitly from family or community members but can be made explicit, particularly for students from disadvantaged circumstances or families with less social capital.

A talent development approach to programming has deliberately incorporated academic and career planning in an effort to help young people attain expertise and set the stage for scholarly productivity and artistry in adulthood. However, academic and career planning is not all generic, and the availability of domain expertise becomes increasingly important at higher stages of talent development.

Relatedly, talent development does not occur spontaneously. Talent development requires vision and the creation of both short- and long-term goals. Educators need to be knowledgeable about how to prepare students at each stage and which types of knowledge, skills, and experiences will maximize potential and achievement and enable students to successfully progress to the next higher stage. In some academic domains, outside-of-school opportunities play a significant role in transforming abilities into competencies and expertise (e.g., sports, music, arts); therefore, "personnel with deep knowledge and expertise in a domain, community resources and talent trajectories in each domain should be part of the gifted education team" [32] (p. 44). Program staff and administrators are integral to creating systematic and continuous services, including access to clubs, competitions, mentors, courses, higher education, and other means of cultivating talent. In addition, they help young people and parents track participation and growth, set goals for achievement, advocate for opportunities at school, and create peer networks.

4.6. Opportunities Must Be Offered and Taken

Though schools will provide students with some talent development opportunities, particularly in academic subjects, many domains of study will require access to supplemental programming and coaching. Whenever possible, it is helpful to create collaborations, or at least to facilitate communication, among schools, families, and community organizations to expand access to opportunities and keep students consistently on their talent development trajectories.

Other considerations are potential barriers to program access, including schedules, transportation, lack of parental awareness or support, cost, language, disability, or student perceptions that programs are not for "people like me". Many of these barriers can be addressed with proactive planning and creative resource allocation. Organizations that provide supplemental programs can help arrange transportation, offer online or alternative site programming, and provide scaffolds and supports for students who have a disability or who are language learners. Well-coordinated and delivered marketing and communication activities and partnerships between schools and other community organizations can provide information to parents, while parent education can be offered through workshops, newsletters, webinars, and other means.

Sometimes, resistance to taking advantage of opportunities comes from within the student. Most often, the reasons include a lack of interest, negative peer or parental pressure, and a lack of confidence in their ability to be successful, particularly in a new activity. This lack of interest may be genuine, or it may derive from not knowing enough about the interesting components of a field outside of the mandated school curriculum. Peer pressure can be alleviated through mentoring and an introduction to new peer groups with similar passions [33]. Dealing with parental pressure is often the most difficult for students as well as for the professionals who work with them in talent development, especially when the family is depending on their child to follow a professional path that may help to move them out of poverty or low-income status. In this case, guidance on keeping options

open, including boundary crossing between science and the arts and humanities, might be helpful.

Hearing from students involved in the programs and having a chance to try an activity without extended commitment, formal evaluation, or incentives can help with these sources of resistance. Small external, extrinsic rewards can be effective, particularly at the beginning of the talent development journey or when trying to encourage students to engage in the practice of basic skills. In the long term, though, students will need to develop a sufficient commitment to sustain their engagement into adulthood.

5. Building a School-Based Talent Development Program Based on the TDMM

5.1. Identify Needs and Monitor Talent Development

A strategic approach to developing a high impact set of talent development services within a school begins with an assessment of local needs, school or district priorities, school and community values, and resource capacity. This macro-level assessment is about understanding stakeholder priorities, setting goals and objectives aligned with the priorities, and allocating resources appropriately. It also sets the groundwork for an evaluation of effectiveness. The assessment of needs also includes collecting and analyzing student data to determine levels of ability and achievement, interests, and learning needs, as well as how each will be served through programming.

5.2. Assessment of Learning Needs and Growth

Learning depends on students experiencing optimally matched challenges—curriculu m and instruction that exposes them to concepts and skills beyond those they have already mastered and psychological supports that help them cope effectively and thrive when challenged. This approach [34] supports continuous growth, motivation for learning, and helps learners develop the executive functioning skills needed for success in higher education and the workplace. When it comes to the assessment of learning needs, there are two main purposes. The first is to identify a student's current level of achievement and/or ability, which can inform decisions about the type and level of service that is required (e.g., enrichment with age-level peers, accelerated pacing, and advanced content typically provided to older students). The second is to inform instructional activities in the classroom, helping the teachers differentiate content, approaches to instruction, or pace of learning.

Educators in talent development programs should engage in three types of assessment: preassessment, formative assessment, and summative assessment. Preassessments serve two purposes: for placement into a particular program or course and for planning responsive instruction once a student is placed. Once students are enrolled in programs, the preassessment helps the teacher customize the program to students' readiness level as well as differentiate within the program for learners with different previous exposure or knowledge of the content.

Formative assessment, or assessment for learning, should take place regularly over the course of a program. It is an assessment of student understanding and provides feedback to the student and teachers on the learning process. Formative assessments occur quickly so that both the teachers and the student can respond and make changes that will increase the effectiveness of the instruction. Formative assessment can also afford opportunities to identify areas of student interest within the curriculum and capture information about learning modality preferences that teachers can use to help teachers tap into students' intrinsic motivation and more effectively differentiate instruction.

Summative assessment, or a teacher's assessment of student learning, is needed at the end of a course or program of study to measure progress toward learning objectives (growth) because of the experience that has been provided. These summative assessments document levels of mastery and growth from the start of the program and result in recommendations for future instruction. A summative assessment might also include opportunities for students to reflect on their learning experience to develop a deeper aware-

ness of their own interests and abilities as well as reflect on the efficacy of their approach to mastering the unit of curriculum to refine their study and metacognitive skills.

For the program leaders, being able to collect and analyze assessment data about students is important for progress monitoring, providing a "big picture" view of how students are moving along their trajectories and moving from stage to stage; for example, are the program experiences preparing students for further advanced learning at the next stage of talent development? Assessments at each stage of talent development can function as checkpoints after students have received services and participated in programs, both in school and outside of school, and can be used in academic and career planning. Ideally, each subject area would have access to gatekeepers or other professionals in the field who can advise or mentor students and discuss non-standardized methods of assessment with the program staff or ways to seek out more niche indicators of creative talent.

5.3. Assessment of Interests

Talent development is maximized when curriculum and instruction connect to learners' own interests and goals and when their efforts are supported and reinforced by peers, teachers, family members at home, and the community at large. Therefore, assessing all learners' interests and values is useful in planning talent development programs and services. Approaches to assessing student interests range from practitioner-designed interest surveys, standardized assessments of interests, and "action research" approaches that sample non-test data (see Table 2). Subject matter experts may want to consider topics that are not available in the school curriculum that are more attractive to some talented students. For example, Krutetskii [20], in his pathbreaking study of mathematically talented students, recognized that students might be gifted in approaching mathematics spatially, such as in topology, rather than formally through numbers and symbols.

Similarly, family and community support are invaluable to building a sustainable set of services for talent development supported by the school community. Surveying and interviewing families about the fields they would like their children to explore, advanced learning opportunities they would like their children to have, their perceptions of their children's strengths and interests, and what obstacles they perceive and encounter in helping support their children in pursuing their interests and aspirations can all be highly informative.

When soliciting family and community input, it is important to be mindful of potential barriers to participation that students and families may experience, such as inflexible work schedules that limit attendance at meetings to inform families of talent development programming, uneven access to telecommunications technologies, home language, or logistics that impact participation in extracurricular or outside-of-school opportunities. Equitable participation in stakeholder input is vital to process validity, as an inconsistent response from stakeholders to requests for input often leads to some perspectives being underrepresented (or unrepresented altogether) in the data, which are then used to inform decision-making processes. Therefore, the provision of multiple opportunities to provide input through multiple means will help ensure that organizational leaders have a clear and accurate understanding of community perspectives. Programming for parents can be instituted to help them deal with the challenges their children may encounter when participating in advanced programs such as fears of failure, perfectionism, or anxiety as well as address issues such as parental expectations for students to pursue particular fields of study rather than following their true interests and passions.

Table 2. Assessment to support talent development in specific subject areas.

Admission and Placement Options	Preassessment for Learning	Formative Assessment for Learning	Summative Assessment of Learning and Growth Monitoring
Cognitive Ability • Assessment of learning skills in verbal, quantitative, nonverbal domains • Cognitive Abilities Test (CogAT) Establishing preferences and strengths profiles Purpose: Assessment of content in domains (Reading, Language, Mathematics, etc.) • Measures of Academic Progress (MAP) Purpose: Aptitude (above-grade-level) • Readiness for advanced instruction (acceleration) in domains • An ability or achievement test given 2 or more years ahead of schedule. The SAT is given to students aged 12–15 Portfolio Purpose: • Products, performance, grades, recommendations indicating ability and achievement in specific domains Interest Inventories Purpose: • Insight into passion areas, motivation, depth of knowledge	Formal • Unit preassessment • Prior unit test • Standardized test • Writing prompt • Work samples and products • Concept maps • Self-evaluations Informal • Questioning • Observation of learning activities • Inventory of what students know, want to know, have learned (KWL) • Turn and talk with peers • Show of hands Purpose: • Identify holes in learning • Identify current knowledge and skills, strengths in the course content • Areas of intense interest and levers for motivation • Opportunities for differentiation (compacting, tiered lessons, complexity, rigor)	Formal • Rubrics • Quizzes • Writing prompts • Concept maps • Graphic organizers • Exit tickets • Homework Informal • Questioning • Observation of learning activities • Discussions with peers • Show of hands • Reflections • Check-ins Purpose: • Check student understanding • Effectiveness of instruction • Areas for greater guidance • Opportunities for differentiation (compacting, tiered lessons, complexity, rigor)	Traditional Formats • Standards-based assessments • Benchmark tests • End-of-unit or end-of-course tests • Above-grade-level assessment Performance Based • Projects or products • Portfolios • Performances • Rubrics Purpose: • Assess the learning that has occurred • Monitor growth over time • Determine readiness for future study • Academic planning

5.4. Program Evaluation

As stated previously, assessment and evaluation at the school level is about understanding stakeholder priorities, setting goals and objectives aligned with the priorities, allocating resources appropriately, and determining effectiveness in meeting goals and adhering to the talent development model. As with the assessment of students, program assessment—looking at the quality and impact of programming—has formative and summative components (see Table 2).

Establishing a consistent, ongoing process for formative assessment allows school leaders and key stakeholders to learn about program strengths and challenges to determine recommendations that lead to improvements. These ongoing assessments—surveys, observations, and discussions with stakeholders—help ensure that programs adhere to evidence-based practices and meet the needs of the students. The goal of formative evaluation is not to pass a holistic judgment on the quality of education for students, but rather to help build consensus around desired outcomes for programming efforts and provide valid baseline data to guide future program development and continuous improvement efforts.

Full-scale summative program evaluations, scheduled on a regular cycle, are helpful for documenting impacts over time and managing resources. They serve as the basis for strategic planning and as a benchmark for continuous improvement. Summative evaluations typically require both internal and external stakeholders to balance insider knowledge with global research and standards of quality. These full-scale summative evaluations are generally recommended to take place every five years unless a significant issue or change precipitates a need for a shorter or longer cycle.

6. Building a Continuum of Services within a School

The TDMM is responsive to students' interests, goals, and assessed needs. Programming and support services intensify as young peoples' abilities (academic, behavioral, and social-emotional) and motivation increase. Movement among levels of service may change over time and through the stages of talent development and should be supported by data from assessments, interest inventories, progress monitoring, and how an individual responds to services. The most challenging to manage is the TDMM principle that domains start at different times. This means that students in later starting domains, those that require more understanding of human behavior, or those who are simply offered later in the school curriculum need to maintain their motivation for learning until they are introduced to the spark that begins the talent development process. For this reason, programming and instruction for traditionally identified intellectually and high achieving students who may be engaged in later starting domains may be maintained through the middle grades, followed by advanced classes in specific domains in upper secondary school.

School leaders are encouraged to see their role as crafting "talent developing" opportunities for all students that match their particular stages of development—and not a single gifted program. This can consist of all types of enrichment programs for students whose talents, motivation, and interests are just emerging while simultaneously having accelerative programs for students with high achievement and motivation [14]. Table 3 describes a framework for a talent development curriculum's scope and sequence.

Table 3. Talent development across grade bands but starting at different grades.

Potential	Competence	Expertise
Students are afforded opportunities for exploration through mostly "low stakes" activities that prioritize hands-on activities, thinking aloud with others, and short opportunities for quiet reflection and independent work. Enrichment focuses on exposing students to a variety of topics, domains, and experiences. Cultivating positive risk-taking, intrepidness, and social skills are important goals. Students who show early indicators of ability and interest in a topic or domain are afforded opportunities for deeper exploration. Exposing students to authentic vocabulary in these fields is a priority. Capacity for self-directed learning is cultivated through center-based learning and choice-based differentiation.	Enrichment begins to shift focus from breadth to depth within students' areas of interest and strength, but opportunities to explore new domains continue. Some activities and experiences related to the talent domain should tap into the rising importance of effective social interaction. Competitions and public exhibitions of student work can be one way to provide opportunities for interaction and cultivate relevant communication skills. Structured simulation activities based on authentic problem scenarios provide opportunities to introduce authentic practices of professionals in domains and values and the "tools of the trade" they use in a safe environment. Students receive early exposure to higher education and career opportunities in the talent domain. Student capacity for self-directed learning is cultivated through short-term, project-based, and problem-based learning. Include match up with mentors who can provide insider knowledge and contacts.	Enrichment focuses on providing opportunities for advanced learning in areas of strength and interest. Co-curricular, extracurricular, community-based, and informal learning are high priorities. Opportunities for career exploration, including extended authentic learning experiences, are core components of the curriculum. Tapping professionals with expertise or experience in fields related to students' talent domains to provide authentic audiences and authentic feedback and integrating community-based learning experiences into programming can help students learn the cultures, values, and specialized language of fields related to their talent domains. Long-range academic planning is a core parallel service alongside curriculum-based program experiences. Capacity for self-directed learning is cultivated through significant online learning experiences and guided independent study. Facilitating student's early entry into a domain of talent is a top priority, especially for students from populations underrepresented in those domains. Students are explicitly taught how to navigate cultures and values of fields related to their domains and are supported in building networks of peers and mentors. Supportive peer affinity groups foster a sustained commitment to talent development in domains of strength and provide networks for emotional support and collaboration. Support from performance psychologists (through counseling and/or expert-designed programs implemented by other facilitators) is available to participants approaching elite competitions, public performances, exhibitions, and auditions to develop mental focus, cope with stress, and develop resilience in the face of setbacks. Mentors pick mentees they want to work with and cultivate and guide them toward niche development.

6.1. Talent Development at the Potential Stage

Keeping in mind that different domains start at different ages, at the potential stage, assessment can include informal observation of interest and ability in response to more advanced or enrichment-oriented programming. More formal assessment through achievement or ability tests can be used for students who demonstrate significant knowledge or advanced skills for the purpose of appropriate placement or acceleration. Enrichment programming should continue to be offered in a variety of domains or subject areas, with

an emphasis on the exploration of ideas, authentic materials, self-directed learning, inquiry, and STEM methodology and developmentally appropriate instructional strategies such as hands-on learning with manipulatives.

These early enrichment opportunities should serve as a conduit to an articulated scope and sequence of courses and content for each subject area—that is, vertical pathways from potential to expertise (see Table 4). Although the emphasis is primarily on exposure, measurable outcomes for learning and psychosocial skill development should be defined, and best practices within gifted education, such as accelerative options, should be used for students who demonstrate advanced skills. Psychosocial skills such as openness to feedback and persistence can be developed through appropriately challenging learning activities that require higher levels of thinking, problem solving, collaboration with peers, and feedback for improvement from teachers.

Table 4. Services at the potential stage.

Assessment	Curriculum and Instruction	Psychosocial Skill Development	Insider Knowledge
Observations of response to challenges and enrichment activities Interest inventories General ability and achievement assessment, when appropriate	Foundational knowledge and skills in a variety of domains Academic skill development through hands-on, collaborative learning activities	Adopting a growth mindset Learning to be open to instruction and feedback about strengths and weaknesses Developing attention, focus, and persistence through good and bad times Developing a sense of agency, self-efficacy Demonstrating executive functioning skills (time management, organization, etc.) Socializing with peers. Working well alone and with others	Invitations to specialists in the fields in question to give informal talks about how they attained their current position and what they wish they knew then that they know now. Moreover, how the field has changed since they were in school.

6.2. Talent Development at the Competency Stage

Although each stage of talent development is important to high levels of achievement and creative productivity in adulthood, the competency stage is a pivot point for many young people. Opportunities for both in-school and outside-of-school enrichment and acceleration play a significant role in moving students through the competency stage to the expertise stage and helping them find specializations within domains that appeal to them for advanced education and careers (see Table 5). The effort to develop foundational knowledge and skills often requires study and practice, which talented students may not be used to or enjoy, presenting a unique challenge to students who may have always found learning easy and effortless.

Table 5. Services at the competency stage.

Assessment	Curriculum and Instruction	Psychosocial Skill Development	Insider Knowledge
Domain-specific assessments of knowledge and interests Projects and performance assessments in content areas Opportunities for above-level assessment of advanced learners Career interest and strength inventories	Content-specific approaches that support "thinking like an expert" and content acquisition Application of reasoning models for critical and creative thinking Accelerated and enriched learning (based on assessment of readiness and learning needs) using problem-based and inquiry-based activities Differentiated learning activities Use of concepts and themes to organize ideas Academic skill development, focus on metacognitive skills (thinking about one's learning) Authentic products that include specific criteria for evaluation/feedback	Balancing extrinsic and intrinsic motivation, particularly when it comes to practicing important skills. Taking responsibility for addressing weaknesses and building on strengths. Demonstrating executive functioning skills (time management, organization, etc.). Seeking out feedback and critique. Taking guided academic risks. Learning to manage competition and overcome failure or setbacks. Focusing on positive emotions such as optimism and hope. Finding a peer group in the domain. Demonstrating empathy.	Mentors share who are the gatekeepers in the field Make it explicit that extracurricular and post-secondary experiences should be considered and planned for Possible sources of finances to support more specialized opportunities The range of subfields possible within a domain and related educational and career paths

In the process of reminding teachers that different domains start at different ages, the assessment of interests and abilities via formal interest surveys, or more informal teacher observations, should continue at this stage so as not to miss "late bloomers." Additionally, domain-specific assessments can be used more frequently for purposes of student placement and program planning (e.g., mathematics assessments for advanced math classes). Above-grade-level assessments should be provided for students who are already performing at the ceiling of achievement tests for their age or grade level.

Accelerative options become increasingly important at this stage and can be applied for an individual student (e.g., several grade skips for a particular subject) or for groups of students, (e.g., an accelerated math or language arts track that compresses several years of content into a smaller time period).

Accelerative options are also necessary at this stage because student competencies become more variable across domains and grade-level classrooms may have students functioning at many different grade levels, making it increasingly problematic to rely on age as a proxy for readiness for specific curriculum. Enrichment options are still important, particularly if they offer advanced content learning and skill development with an emphasis on authentic materials and experiences (e.g., competitions, projects), self-directed learning, inquiry, and STEM methodology. At this stage, programming should begin the process of exposing students to more authentic work in a domain through projects, exposure to adult professionals, and exposure to the tools and values that domain experts employ in their work. Additionally, less advanced enrichment options can be used as extracurricular activities to allow late bloomers to shine and demonstrate interest and potential.

Psychosocial skill development can be fostered at this stage in several ways:

- The use of authentic materials that result in learning experiences that require application and problem-solving in the domain;
- The designing of courses for more advanced learners;
- Constructive feedback given by experienced teachers to students about their problem-solving, creativity, and motivation;
- Opportunities for regional, national, and international competitions to allow students to benchmark their skills against other students, practice important communication and interpersonal skills, and learn to manage setbacks or success productively.

6.3. Talent Development at the Expertise Stage

Not everyone aspires to achieve eminence nor is able to reach that level of talent development; however, when well matched to careers aligned with their interests and strengths, far more people have the potential to experience a lifetime of achievement and fulfillment and reach expertise. At this stage of talent development, assessments of ability and potential should be solely domain specific, including the participation of adult professionals within the domain who have considerable knowledge about the content expertise needed but also other characteristics that are important for success in their field. These individuals may be more open to individuals viewed as having atypical profiles and how they might succeed in a particular area of their domain. Assessments at this stage can also include career interest inventories and leadership surveys to assist with career guidance and goal setting and offer recommendations or plans based on results.

At the stage of expertise, talent development programming should consist of opportunities that provide in-depth, authentic learning experiences that develop the skills necessary for achievement in careers (public speaking, leadership, communication) taught by practitioners with expertise in the subjects they are teaching—that is, they are connected to institutions of higher learning, industry, community organizations, etc. (see Table 6). In alignment with the talent development model, the program can deliberately incorporate career exposure and planning into each offering, explore and provide mentorship and internship services in the various tracks, and include entrepreneurial programming for the incubation of ideas. Psychosocial skills are best fostered at this stage through contact with adult professionals in the domain and through mentors.

6.4. Academic and Career Pathway Planning

Academic planning and career pathway exploration can start early in talent developm ent—as young as elementary school [35] (Wood et al., 2018) when it comes to mathematics. This does not mean academic tracking or early specialization, but rather exposure to a variety of domains, leveraging strengths and interests to maximize engagement and motivation, as well as establishing both short- and long-term goals for learning and achievement.

Academic planning and career exploration are valuable for young people at the potential and competency stages of their talent development, as they begin to envision possibilities for the future based on their interests, skills, and exposure to domains. Once a student's abilities and needs have been identified—through achievement or aptitude tests, observations, conversations with family members, engagement with challenging curricula, or other means—a plan for systematic and continuous educational plan for courses and talent development opportunities through secondary school, university, and beyond should be developed with the assistance of subject matter specialists from inside and outside of the school system, as well as respected practitioners in related fields. For students who are accelerating through high-level curricula at a pace faster than age-level peers, it is important to plan out course sequences to allow for mentorships or internships, or other career pathways.

Table 6. Services at the expertise stage.

Assessment	Curriculum and Instruction	Psychosocial Skill Development	Insider Knowledge
Domain-specific assessments (skills, knowledge)	Advanced, in-depth content on majors and professions	Capitalizing on strengths while shoring up weaknesses	Where to go next for the next period of academic learning (e.g., institutions that are renowned for training in a particular domain or area of research)
Assessment by professionals through authentic tasks	Exposure to related content or skills needed for high-level achievement in the domain	Being comfortable with intellectual tension and with varied perspectives	
	Entry into professional and creative domains (internships, apprenticeships)	Strategic risk-taking	Who are the gatekeepers and current leaders and innovators in desired domains
	Work with experts, authentic tasks	Self-promotion, learning the rules of the field (explicit and tacit)	What are the typical obstacles they might encounter and how to manage them (e.g., finding a mentor, crossing disciplinary boundaries)
		Social skills, including arriving on time, being prepared, being courteous, and accepting success and failure with resilience	Prioritizing time and mental resources
		Ability to manage competing priorities. Knowing when to ask for assistance.	How to build and capitalize on a network of colleagues
		Collegiality and networking with peers	

Specific to career exploration, young people in the potential and competency stages need opportunities to do the following:

- Compare and contrast different fields of study and related careers within a domain;
- Examine how careers or fields of study are connected to the things they are learning in their classes and workshops;
- Interview professionals about their work and pathway (education, experience) to learn:
    - What someone in the career does regularly;
    - The type and level of education and/or training required;
    - What the work environment is like (indoor/outdoor, individual or team, amount of travel, etc.);
    - What kind of work/life balance is required;
    - Options for growth, a typical trajectory, and related careers/positions.

According to Wood et al. [35], "determining a career direction is a central focus for adolescents who are entering adulthood and is an iterative process that may be revisited several times in their lifespan" (p. 629). Unfortunately, career counseling is not usually as accessible as it needs to be to help young people reach their full potential. In many cases, it is not until they reach young adulthood that career counseling is provided, and, even then, it is generalized, not based on interests, skills, and experiences.

At the expertise stage, activities that help adolescents and young adults determine likes and dislikes, strengthen their self-efficacy, and determine to what extent their interests are motivating choices include the following:

- Completing career interest and values inventories and reviewing results with professionals;
- Receiving exposure to occupations through career fairs, interviews with professionals, workshops, or self-study (books, web searches, etc.);

- Engaging in self-reflection exercises that examine past successes and challenges, prior work experiences, extracurricular activities for skills learned, likes and dislikes about the experiences, and hopes for future opportunities;
- Working with a counselor and peers with similar interests and abilities to envision future outcomes and develop goals consistent with their dreams and abilities;
- Practicing agency and advocacy in identifying and fulfilling goals;
- Exploring what future jobs will look like, especially in emerging fields such as artificial intelligence, green energy, engineering, and big data;
- Focusing on skills that will be critical in a wide range of career fields, including problem solving, critical thinking, communication, and collaboration.

7. Discussion and Future Directions

A key distinction between traditional gifted education and TDMM is the intended outcome or goal of gifted programming. In the gifted child approach, providing educational programs that are a better match to students' learning abilities is the immediate goal, and the long-term goal is often unspecified [23]. In the talent development framework, the immediate goal is to help children acquire both the cognitive and psychosocial skills needed to move to the next stage of talent development—for example, to move from potential to competency to expertise and to keep students on that path. The long-term goal is to enable more individuals to become creative producers in adulthood and to achieve at eminent levels [1,9]. However, given that the path from childhood to adulthood is long, filled with chance events, and affected by choices and opportunities, it is not expected that all or even many gifted children will produce transformational ideas or products.

The goal of talent development is to prepare children with the knowledge, psychosocial skills, and support they need to be able to function at the highest levels *they desire* in their chosen fields. Individuals may decide not to proceed on a path toward eminence, and professionals are obliged to honor those decisions without coercion; however, the choice should be based on personal values and preferences, rather than poorly developed psychosocial skills, inadequate preparation, or a lack of appropriate opportunities and insider knowledge [14]. By having the highest levels of achievement and creativity as the long-term goal of programming, more gifted children might pursue paths towards levels of excellence in their chosen areas of interest and talent. Some fields are less developed, competitive, and filled with tradition than others (e.g., software engineering vs. medicine), making transformational contributions [36] (McWilliams et al., 2109) more accessible and less subject to gatekeepers and other constraints. New fields will emerge over time. Finally, a specialized career guidance team could help individuals create academic and career plans, develop portfolios in preparation for job interviews or applications for university, and provide connections to businesses, government resources, and other networks.

7.1. Supporting Talent Development at Home

Families have a strong influence on children's beliefs, values, and opportunities, and, consequently, they have an important role in talent development. When it comes to developing talents fully—particularly in students with exceptional potential in a domain—the influence of the family can be the determining factor in whether that potential is actualized. Engaging parents in talent development starts with making the philosophy, framework, and related continuum of services available to families by posting it on website pages and through other social media, providing program materials to parents in their home language, and through parent meetings. Providing clear, comprehensive information helps ensure that all parents, teachers, and students in the community have access to and understand what to expect from the opportunities available to participants. Experts in gifted education, talent development, and career development can offer workshops and seminars for parents on topics that are relevant to the age and talent development stage (see Table 7). Parent workshops need to be tailored to the community. For example, a concern

for some families is that talent development programs will result in their children leaving their communities or choosing careers that are not acceptable to family values.

Parents are their children's first teachers, and this frequently means that parents introduce children to talent domains with which they are most familiar—through their careers, their own hobbies, or family-based activities. In one study [37], researchers found that most of the talented individuals they interviewed were introduced to their eventual talent domains at a very young age by their parents. Though some children have interests and strengths that align with their parents, others do not. Additionally, new fields of study and careers emerge regularly, and talent pipelines need to be developed. If children are mainly introduced to potential areas of interest and study by parents, it makes sense, from a talent development perspective, to introduce parents to unique and rapidly evolving domains that may appeal to their children.

Table 7. Potential topics for parent education.

Emergent Talent Stage
• Talent Development Theory
• Talent Identification: Finding Children's Strengths and Interests
• Being Open to Areas of Interest Outside the Family's Experience
• Finding Talent Development Opportunities: The Role of Enrichment and Supplemental Programming in Talent Development
• Social-Emotional Needs in a Talent Development Approach
• Non-cognitive Skills that Support Achievement and Performance
• Advocating Effectively for Your Child
• Competency Stage
• Parenting for Achievement and High Performance: Finding Talent Development Opportunities
• The Role of Assessment and Monitoring Growth in Talent Development
• Enrichment and Accelerated Programming
• Developing Autonomous Learners
• Connecting with Peers and Creating Networks Inside and Outside of School
• Non-cognitive Skills that Support Achievement and High Performance
• Becoming Familiar with the Role of Mentors
• Working Collaboratively with Schools
• Planning for Higher Education and Career Exploration
• Expertise Stage
• The Essential Role of Mentorships and Internships
• Creative Productivity in Adulthood—Joys and Sacrifices
• High-Performance Psychosocial Skills
• Networking with Peers and Professionals
• Getting Ready for Higher Education and Careers

7.2. Supporting Talent Development in the Classroom

Young people need teachers and mentors with expertise and experience to help them fully develop their talents. One aspect of expertise is content and tacit knowledge of a domain, and another important aspect of expertise is pedagogical knowledge and familiarity with the talent development model and the content and skills of the subject beyond the grade level of instruction.

Teachers and program administrators will likely need professional learning opportunities from the fields of gifted education and talent development, including the tenets of the TDMM, knowledge about how talent can manifest in different domains of ability and their trajectories, and knowledge about the cognitive and psychosocial skills necessary at each stage of talent development. Teachers may also need to have higher levels of content knowledge in order to meet the demands for more advanced content earlier.

Talent development requires that educators regularly assess interests, strengths, and learning needs and adjust instruction and learning outcomes in response.

Therefore, knowledge and consistent use of tools and strategies for preassessment, formative assessment, and the identification of advanced learning needs are critical. Creating optimally matched learning environments that result in talent development requires that educators and program administrators be knowledgeable of approaches to accelerating instruction for students who have demonstrated a mastery of content or potential for advanced learning. There are many forms of acceleration, from early entrance to school or educational programming to compacting instruction to minimize the amount of time spent on material students have already mastered. Topics for professional learning could include (a) compacting instruction, (b) tiering lessons, and (c) increasing rigor and complexity through leveled questioning. Teachers and program coordinators should be able to adjust content and programming to address pace (rate of instruction), depth (deepening the knowledge of a domain), and complexity (using advanced thinking strategies), and schools need to have a policy and procedure in place to make decisions about how and when to allow students to enroll in programs early (which has typically been allowed based on age or previous course work).

8. Conclusions

Although school is the primary place for embarking on a talent development trajectory, it cannot be the sole place for an expansive view that includes the acquisition of expertise in any domain. Students will need support outside of school from programs, mentors, competitions and fairs, and higher education. This article focused specifically on talent development that can reasonably take place in school with the assistance of school personnel that are knowledgeable about out-of-school services and opportunities. In this article, we distinguish between programming that is based on developing domain talents from that of a traditional gifted education that assumes that a gifted child is globally gifted. We offer principles that feature a reliance on cognitive and psychosocial development, as well as suggestions based on best practices to support identifying potential, assessing growth, and incorporating a wide array of professionals and adults in supporting talented children and youth to achieve their goals and aspirations.

Author Contributions: Conceptualization, R.F.S., P.O.-K., S.C., E.C. and F.C.W.; data collection and analysis, R.F.S., P.O.-K., S.C., E.C. and F.C.W.; writing—original draft preparation, R.F.S., P.O.-K., S.C., E.C. and F.C.W.; writing—review and editing, R.F.S., P.O.-K., S.C., E.C. and F.C.W. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: No new data were created for this article.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Subotnik, R.F.; Olszewski-Kubilius, P.; Worrell, F.C. Rethinking giftedness and gifted education: A proposed direction forward based on psychological science. *Psych. Sci. Pub. Int.* **2011**, *12*, 3–54. [CrossRef] [PubMed]
2. Dweck, C.S. Mindsets and malleable minds: Implications for giftedness and talent. In *Malleable Minds: Translating Insights from Psychology and Neuroscience to Gifted Education*; Subotnik, R.F., Robinson, A., Callahan, C.M., Johnson, P., Eds.; National Center for Research on Giftedness and Talent, University of Connecticut: Storrs, CT, USA, 2012; pp. 7–18.
3. Ericsson, K.A.; Nandagopal, K.; Roring, R.W. Giftedness viewed from the expert-performance perspective. *J. Educ. Gift.* **2005**, *28*, 287–311. [CrossRef]
4. Olszewski-Kubilius, P.; Subotnik, R.F.; Worrell, F.C. Domain specific abilities and characteristics: Evolving central components of the talent development megamodel. *High Ability Studies.* **2022**. [CrossRef]

5. Farrington, C.A.; Roderick, M.; Allensworth, E.; Nagaoka, J.; Keyes, T.S.; Johnson, D.W.; Beechum, N.O. *Teaching Adolescents to Become Learners. The Role of Noncognitive Factors in Shaping School Performance: A Critical Literature Review*; University of Chicago Consortium on Chicago School Research: Chicago, IL, USA, 2012.
6. Olszewski-Kubilius, P.; Subotnik, R.F.; Davis, L.C.; Worrell, F.C. Benchmarking psychosocial skills important for talent development. *New Dir. Child Adolesc. Dev.* **2019**, *168*, 161–176. [CrossRef] [PubMed]
7. Subotnik, R.F.; Jarvin, L. Beyond expertise: Conceptions of giftedness as great performance. In *Conceptions of Giftedness*, 2nd ed.; Sternberg, R.J., Davidson, J., Eds.; Cambridge University Press: New York, NY, USA, 2005; pp. 343–357.
8. Olszewski-Kubilius, P.; Cross, T.L. Charting a course for the future. In *Conceptual Frameworks for Giftedness and Talent Development*; Cross, T.L., Olszewski-Kubilius, P., Eds.; Prufrock Press: Waco, TX, USA, 2020; pp. 357–364.
9. Worrell, F.C.; Subotnik, R.F.; Olszewski-Kubilius, P. Giftedness and eminence: Clarifying the relationship. *Gift. Talent. Int.* **2021**, *36*, 3–14. [CrossRef]
10. Bloom, B. (Ed.) *Developing Talent in Young People*; Ballantine Books: New York, NY, USA, 1985.
11. Cross, J.R.; Cross, T.L. A Catalyst for Change: Improving the World Through Talent Development. In *The Palgrave Handbook of Transformational Giftedness for Education*; Sternberg, R.J., Ambrose, D., Karami, S., Eds.; Palgrave Macmillan: Cham, Switzerland, 2022. [CrossRef]
12. Olszewski-Kubilius, P. Corwith S. Poverty, academic achievement, and giftedness: Literature review. *Gift. Child Q.* **2018**, *62*, 37–55. [CrossRef]
13. Olszewski-Kubilius, P.; Subotnik, R.F.; Worrell, F.C. *Talent Development as a Framework for Gifted Education: Implications for Best Practices and Applications in Schools*; Routledge: New York, NY, USA, 2018.
14. Olszewski-Kubilius, P.; Thomson, D. Talent development as a framework for gifted education. *Gift. Child Today* **2015**, *38*, 49–59. [CrossRef]
15. Olszewski-Kubilius, P.; Subotnik, R.F.; Worrell, F.C. The role of domains in the conceptualization of talent. *Roeper Rev.* **2017**, *39*, 59–69. [CrossRef]
16. Park, G.; Lubinski, D.; Benbow, C.P. Contrasting intellectual patterns predict creativity in the arts and sciences: Tracking intellectually precocious youth over 25 years. *Psychol. Sci.* **2007**, *18*, 948–952. [CrossRef] [PubMed]
17. Wai, J.; Lubinski, D.; Benbow, C.P. Creativity and occupational accomplishments among intellectually precocious youths: An age 13 to age 33 longitudinal study. *J. Educ. Psychol.* **2005**, *97*, 484–492. [CrossRef]
18. Wai, J.; Lubinski, D.; Benbow, C.P. Spatial ability for STEM Domains: Aligning over 50 years of cumulative psychological knowledge solidifies its importance. *J. Educ. Psychol.* **2009**, *101*, 817–835. [CrossRef]
19. Clements, D.; Sarama, J. Early childhood mathematics intervention. *Science* **2011**, *333*, 968–970. [CrossRef] [PubMed]
20. Krutetskii, V.A. *The Psychology of Mathematical Abilities in School Children*; University of Chicago Press: Chicago, IL, USA, 1976.
21. Libertus, M.E.; Feigenson, L.; Halberda, J. Preschool acuity of the approximate number system correlates with school math ability. *Dev. Sci.* **2011**, *14*, 1292–1300. [CrossRef] [PubMed]
22. Siegler, R.S.; Duncan, G.J.; Davis-Kean, P.E.; Duckworth, K.; Claessens, A.; Engel, M.; Susperreguy, M.I.; Chen, M. Early predictors of high school mathematics achievement. *Psychol. Sci.* **2012**, *23*, 691–697. [CrossRef] [PubMed]
23. Dai, D.Y. *The Nature and Nurture of Giftedness: A New Framework for Understanding Gifted Education*; Teachers College Press: New York, NY, USA, 2010.
24. Dai, D.Y.; Chen, F. *Paradigms of Gifted Education*; Routledge: New York, NY, USA, 2014.
25. Olszewski-Kubilius, P. The role of outside of school programs in talent development for secondary students. In *The Handbook of Secondary Gifted Education*, 2nd ed.; Dixon, F.A., Moon, S.M., Eds.; Prufrock Press: Waco, TX, USA, 2015; pp. 261–282.
26. Dixson, D.D.; Worrell, F.C.; Olszewski-Kubilius, P.; Subotnik, R.F. Beyond perceived ability: The contribution of psychosocial factors to academic performance. *Ann. N. Y. Acad. Sci.* **2016**, *1377*, 67–77. [CrossRef] [PubMed]
27. Subotnik, R.F.; Pillmeier, E.; Jarvin, L. The psychosocial dimensions of creativity in mathematics: Implications for gifted education policy. In *Creativity in Mathematics and the Education of Gifted Students*; Leikin, R., Berman, A., Koichu, B., Eds.; Sense Publications: Rotterdam, The Netherlands, 2009; pp. 165–180.
28. Dweck, C.S. *Mindsets. The New Psychology of Success*; Ballantine: New York, NY, USA, 2008.
29. Subotnik, R.F.; Olszewski-Kubilius, P.; Worrell, F.C. High performance: The central psychological mechanism for talent development. In *The Psychology of High Performance: Developing Human Potential into Domain-Specific Talent*; Subotnik, R.F., Olszewski-Kubilius, P., Worrell, F.C., Eds.; American Psychological Association: Washington, DC, USA, 2019; pp. 7–20.
30. Jarvin, L.; Subotnik, R.F. Understanding elite talent in academic domains: A developmental trajectory from basic abilities to Scholarly Productivity/Artistry. In *The Handbook of Secondary Gifted Education*, 2nd ed.; Dixon, F.E., Moon, S.M., Eds.; Routledge: New York, NY, USA, 2015; pp. 217–236.
31. Zeidner, M.; Stoeger, H. Self-regulated learning: A guide for the perplexed. *High Abil. Stud.* **2019**, *30*, 9–51. [CrossRef]
32. Subotnik, R.F.; Olszewski-Kubilius, P.; Khalid, M.; Finster, H. A developmental view of mentoring talented students in academic and nonacademic domains. *Ann. N. Y. Acad. Sci.* **2020**, *1483*, 199–207. [CrossRef] [PubMed]
33. Gabelkp, N.H.; Sosniak, L.A. Someone Just like Me': When Academic Engagement Trumps Race, Class, and Gender. *Phi Delta Kappan* **2002**, *83*, 400–405. [CrossRef]
34. Neihart, M. *Peak Performance for Smart Kids: Strategies and Tips for Ensuring School Success*; Prufrock Press: Waco, TX, USA, 2008.

35. Wood, S.M.; Klose Smith, C.; Duys, D.K. Career counseling and the gifted individual: Applying social cognitive career theory to the career decision making of gifted individuals. In *APA Handbook of Giftedness and Talent*; Pfeiffer, S.I., Ed.; American Psychological Association: Washington, DC, USA, 2018; pp. 629–644.
36. McWilliams, M.A.; Holding, E.Z.; Knotek, S.E. Talent development in medicine and software engineering. In *The Psychology of High Performance: Developing Human Potential into Domain-Specific Talent*; Subotnik, R.F., Olszewski-Kubilius, P., Worrell, F.C., Eds.; American Psychological Association: Washington, DC, USA, 2019; pp. 109–134.
37. Witte, A.L.; Kiewra, K.A.; Kasson, S.C.; Perry, K.R. Parenting talent: A qualitative investigation of the roles parents play in talent development. *Roeper Rev.* **2015**, *37*, 84–96. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.