



Review Article

Theories of giftedness and their practical implications: orientation areas of giftedness potential in Türkiye

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Abstract

This article explores the theoretical foundations and practical implications of giftedness, with a focus on how gifted potential is identified and nurtured in Türkiye. Giftedness, defined as exceptional ability in domains such as academics, arts, leadership, and creative problem-solving, is examined through historical perspectives and contemporary models, including Renzulli's Three-Ring Model, Gardner's Theory of Multiple Intelligences, and Subotnik's Talent Development Model. The study highlights the cognitive, emotional, and social characteristics of gifted individuals, supported by neuroscience insights into brain structures enhancing cognitive flexibility. In Türkiye, the education of gifted students primarily occurs through "cience and Art Center (SAC), which emphasize intellectual and artistic development, while institutions like science high schools focus on academic achievement rather than a comprehensive giftedness framework. The article also investigates the orientation of gifted students and their families toward talent domains, revealing a societal preference for lucrative fields like medicine over arts or sports due to economic and cultural factors. Challenges such as economic concerns, and family pressures further complicate career decisions. The findings underscore the need for a multidimensional approach to support gifted individuals' diverse potentials in Türkiye's educational landscape.

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Introduction

Giftedness and high intelligence represent some of the most fascinating and complex facets of human potential. These concepts refer to an individual's ability to exhibit markedly superior performance in specific domains compared to their peers. However, the definition of giftedness has evolved throughout history and varies across cultures. Today, a widely accepted definition frames giftedness as an individual's exceptional capacity in areas such as academics, the arts, leadership, or creative problem-solving (Renzulli, 1978). This article examines the definition, core characteristics, historical development, and manifestations of giftedness and high intelligence across diverse domains.

Definition and Core Characteristics of Giftedness and High Intelligence

Giftedness and high intelligence denote an individual's capacity to demonstrate significantly superior performance in a given domain relative to their peers. Traditionally, high intelligence has been associated with elevated IQ scores; however, giftedness is conceptualized within a broader framework that encompasses exceptional competencies in academics, the arts, leadership, and productivity. The National Association for Gifted Children (NAGC) defines giftedness as pertaining to "individuals who demonstrate advanced performance in a specific domain compared to their peers" (NAGC, 2020). Contemporary perspectives, however, suggest that giftedness is not a static trait but is shaped by

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environmental factors, motivation, and developmental processes. For instance, Renzulli's Three-Ring Model defines giftedness as the intersection of above-average ability, creativity, and task commitment, emphasizing that these traits emerge not solely from innate predispositions but also through supportive environments (Renzulli, 1978).

Recent research has deepened the understanding of giftedness by adopting more comprehensive perspectives. The Talent Development Model, proposed by Subotnik et al. (2011), posits giftedness as a lifelong process that begins with potential in early childhood and flourishes with appropriate opportunities. This model underscores the importance of motivation, opportunities, and psychosocial skills in realizing an individual's potential. Similarly, Sternberg's Theory of Successful Intelligence (1997) defines intelligence as a composite of analytical, creative, and practical abilities, arguing that giftedness extends beyond academic achievement to encompass success across various life domains.

The core characteristics of gifted individuals manifest across cognitive, emotional, and social dimensions. Cognitively, these individuals often exhibit intense curiosity, rapid learning capacity, advanced problem-solving skills, and abstract thinking (Winner, 1996). For example, a mathematically gifted child may effortlessly solve complex problems that challenge their peers. However, these strengths can be accompanied by emotional and social challenges. Silverman (1993) notes that gifted individuals may experience heightened emotional intensity, perfectionism, and difficulties with social adjustment. Their unique interests can set them apart from peers, potentially leading to social isolation (Neihart, 1999). Moreover, perfectionist tendencies may trigger anxiety and fear of failure (Fonseca, 2024).

Current research also provides insights into the brain structures and learning styles of gifted individuals. Neuroscience studies indicate that individuals with high intelligence possess greater gray matter volume in the prefrontal cortex, enhancing cognitive flexibility and problem-solving capabilities (Geake, 2009). In terms of learning styles, these individuals often favor visual-spatial and kinesthetic approaches, suggesting that traditional educational systems may inadequately address their needs (Kanevsky, 2011).

Cultural and societal differences play a significant role in shaping the definition and perception of giftedness. Western societies tend to prioritize individual achievement and creativity, while Eastern cultures emphasize collective harmony and disciplined effort (Phillipson & McCann, 2020). For instance, in Japan, giftedness is often associated with mastery in artistic and academic domains, whereas in the United States, it is linked to innovation and creative thinking (Matsumura, 2020). These variations highlight that giftedness lacks a universal definition and is molded by cultural values.

In conclusion, giftedness and high intelligence constitute a multidimensional construct encompassing cognitive, emotional, and social dimensions of an individual's potential. Contemporary research reveals that these traits extend beyond innate abilities, developing through environmental support and personal effort. Thus, identifying and nurturing gifted individuals is critical to enabling them to fully realize their potential.

Historical Development and Key Theories

The concepts of giftedness and high intelligence have been defined and studied in various forms throughout human history. In Ancient Greece, Plato and Aristotle argued that intelligence was innate and that superior individuals should govern society (Tannenbaum, 1983). However, the systematic exploration of these concepts emerged during the Renaissance, when individual talents gained prominence. Figures like Leonardo da Vinci exemplified the unique manifestations of giftedness in art and science.

The 19th century marked a pivotal moment as giftedness became a subject of scientific inquiry. Francis Galton's *Hereditary Genius* (1869) posited that intelligence was hereditary, with gifted individuals often sharing familial traits of excellence (Galton, 1869). While Galton's work laid the groundwork for measuring intelligence, his eugenic ideas have drawn modern criticism.

The early 20th century saw the concretization of intelligence measurement. Alfred Binet and Theodore Simon's intelligence tests, developed in 1904, aimed to identify children's educational needs but also proved effective in recognizing high intelligence (Binet & Simon, 1904). Lewis Terman refined these tests into the Stanford-Binet Intelligence Test and, in his 1925 work *Genetic Studies of Genius*, conducted longitudinal studies of gifted children with

IQ scores of 130 or higher (Terman, 1925). Though influential, Terman's research has been critiqued for its narrow focus on cognitive abilities and neglect of cultural factors.

The 1950s and 1960s highlighted the educational significance of giftedness. The launch of Sputnik spurred efforts in the United States to cultivate talent in science and mathematics (Gallagher, 2008). J.P. Guilford's model of intelligence emphasized creative and divergent thinking, illuminating the multifaceted nature of giftedness (Guilford, 1967).

The 1970s and 1980s saw the rise of multidimensional theories. Howard Gardner's Theory of Multiple Intelligences (1983) identified eight distinct domains of intelligence—linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal, and naturalistic—demonstrating that giftedness transcends academic success (Gardner, 1983). Joseph Renzulli's Three-Ring Model (1978) defined giftedness as a combination of above-average ability, creativity, and task commitment, shaped by environmental support and effort (Renzulli, 1978).

Contemporary approaches view giftedness as a developmental process. The Talent Development Model by Subotnik et al. (2011) suggests that talents emerge as potential in early life and mature through mentorship and motivation (Subotnik et al., 2011). Sternberg's Theory of Successful Intelligence (1997) frames intelligence as a blend of analytical, creative, and practical skills, applicable to diverse domains of achievement (Sternberg, 1997).

Neuroscience research reveals that gifted individuals exhibit increased gray matter volume in the prefrontal cortex and parietal lobes, supporting cognitive flexibility and creative thinking (Geake, 2009). Cultural diversity also informs modern theories, with Western emphasis on individual success contrasting with Eastern focus on collective harmony (Phillipson & McCann, 2020). In summary, the historical journey of giftedness and high intelligence—from Galton and Terman to Gardner, Renzulli, and neuroscientific advancements—has evolved into a multidimensional concept. This evolution provides a critical foundation for recognizing and supporting gifted individuals.

Manifestations of Giftedness in Different Domains

Giftedness is characterized by superior performance in specific domains relative to peers, extending beyond academics to include artistic creativity, leadership, creative problem-solving, and social intelligence. Howard Gardner's Theory of Multiple Intelligences (1983) posits that intelligence and giftedness vary according to an individual's strengths. This section explores how giftedness manifests in academic, artistic, leadership, and creative problem-solving domains, supported by current research and examples.

Giftedness in the academic domain

Academic giftedness refers to an individual's capacity to excel in specific disciplines, such as mathematics, science, language, literature, or social sciences, relative to their peers. Gifted individuals in this domain exhibit rapid comprehension of complex concepts, abstract thinking, analytical problem-solving, and extensive knowledge accumulation. For instance, a mathematically gifted child may solve algebraic equations that confound their peers or independently design complex scientific experiments. These traits suggest that academic giftedness is not solely a function of mental capacity but is also shaped by motivation, self-regulation, and attitudes toward learning.

Historically, Lewis Terman's Genetic Studies of Genius (1925) demonstrated that gifted individuals exhibit extraordinary achievements from an early age, tracking their academic competencies over time. Contemporary research adopts a broader perspective. Dai (2017) argues that academic giftedness is fueled by intrinsic motivation and learning attitudes beyond cognitive ability. Neuroscience supports this view, with Geake (2009) identifying denser synaptic connections in the prefrontal cortex of gifted individuals, enhancing information processing speed and creative thinking capacity.

Educationally, traditional methods often fail to support academic giftedness adequately. These individuals' visual and kinesthetic learning styles necessitate differentiated instructional strategies (Kanevsky, 2011). Rogers (2007) advocates acceleration (e.g., skipping grades) and enrichment (e.g., deeper content) as effective methods to unlock their potential. Longitudinal studies by Lubinski and Benbow (2006) confirm that early educational opportunities lead to greater academic and professional success.

Current research also emphasizes environmental factors—teacher awareness, family support, and educational flexibility—as critical to talent development. In countries like Turkey, the lack of systematic programs for gifted individuals may hinder potential realization. Thus, academic giftedness requires holistic support addressing cognitive, emotional, and social dimensions.

Giftedness in the artistic domain

Artistic giftedness is defined by exceptional skill and sensitivity in creative disciplines such as music, visual arts, literature, theater, or dance. This talent transcends technical mastery, encompassing aesthetic perception, emotional depth, and original expression. Historical examples, such as Wolfgang Amadeus Mozart composing at age five (Sadie, 2006) or Frida Kahlo transforming personal pain into art, highlight the early emergence and emotional intelligence of artistic talent. These individuals often excel in visual-spatial intelligence and creative thinking, linked neurologically to right-brain dominance.

Recent research explores the biological and environmental underpinnings of artistic giftedness. Neuroscience studies associate artistic creativity with heightened activity in the temporal lobe and parietal cortex (Chakravarty, 2012). However, talent is not solely biological; intrinsic motivation and persistent practice are foundational to its development (Roe, 1953). Early exposure to artistic activities also accelerates progress (Hetland & Winner, 2004), underscoring the critical role of arts education.

Standard curricula often fail to nurture artistic giftedness, necessitating flexible programs tailored to individual interests. Csikszentmihalyi's (1996) concept of "flow" highlights how deep focus enhances creative output, suggesting that educational environments should encourage risk-taking and experimentation. Mentorship and artistic communities further support development, with Bloom (1985) emphasizing the pivotal role of expert guidance.

Technology's impact on artistic giftedness is increasingly significant. Digital platforms and AI tools expand creative boundaries, though experts argue they cannot fully replicate the emotional depth of human artistry. Thus, artistic giftedness remains a uniquely human endeavor, shaped by cognitive, emotional, and environmental factors, with transformative potential at individual and societal levels.

Giftedness in the leadership domain

Leadership giftedness involves the ability to effectively guide groups, create visions, motivate others, and navigate complex social dynamics. Beyond charisma or authority, it relies on social intelligence, emotional awareness, ethical values, and inclusivity. Early signs may include leading school projects or addressing social issues. Historical figures like Nelson Mandela and Mahatma Gandhi exemplify leadership's transformative power.

Modern research highlights that leadership giftedness transcends cognitive intelligence, intertwining with emotional (EQ) and social intelligence. Goleman's (1995) emotional intelligence theory emphasizes empathy and self-regulation as vital leadership traits. Sternberg (2003) adds that practical intelligence and creative problem-solving enhance adaptability and innovation. Neuroscience links leadership to prefrontal cortex and amygdala activity, governing decision-making and emotional regulation (Waldman et al., 2011).

Educational approaches to leadership development include mentorship and project-based learning, fostering confidence and strategic thinking (Chan, 2000). Inclusive leadership models, valuing diverse perspectives, are increasingly prominent. Technology, such as digital platforms and AI-driven analytics, enhances leadership capabilities, though ethical and human-centered principles remain essential. Leadership giftedness emerges from social-emotional competencies, environmental support, and continuous learning, offering significant potential for societal progress when nurtured ethically.

Creative problem-solving and innovation

Creative problem-solving and innovation involve devising novel, effective solutions to complex challenges, requiring divergent thinking, risk-taking, and interdisciplinary knowledge integration. Historical examples like Leonardo da Vinci's flying machines and Thomas Edison's light bulb, alongside Elon Musk's contemporary innovations in space travel and electric vehicles, illustrate this talent's transformative impact.

Musk's SpaceX addressed high space travel costs with reusable rockets, achieving a milestone with Falcon 9's 2017 reuse. Tesla's solutions to electric vehicle range and infrastructure revolutionized the automotive industry. His interdisciplinary approach and risk tolerance, evident in Neuralink's brain-computer interfaces, highlight boundless innovation.

Research links creative problem-solving to cognitive flexibility, emotional intelligence, and motivation (Runco, 2014). Neuroscience identifies the prefrontal cortex and limbic system as key to innovative thinking (Dietrich, 2004). Educationally, project-based learning fosters real-world problem-solving (Beghetto & Kaufman, 2014). Technology, including AI like DeepMind's AlphaFold, amplifies innovation, though ethical considerations remain paramount. Creative problem-solving blends vision, risk, and knowledge, with Musk exemplifying its modern potential. Its future hinges on ethical, inclusive advancement.

Supporting Giftedness Domains in Türkiye

The support of giftedness domains in Türkiye has emerged as a significant topic within the framework of educational policies and practices in recent years. The education of gifted individuals is systematically addressed, primarily through specialized institutions such as SACs (Kılınç & Sözer, 2024), while other educational establishments, including science high schools, social sciences high schools, and sports schools, stand out as competency- and achievement-oriented structures. SACs are specifically designed for the identification and education of gifted students, focusing on the development of intellectual abilities, such as logical-mathematical and verbal-linguistic intelligence (Çelikten, 2017). Grounded in Gardner's Theory of Multiple Intelligences, SACs programs also foster individual talents in artistic domains (e.g., musical-rhythmic and visual-spatial intelligence) and scientific fields. However, science high schools, social sciences high schools, and sports schools do not operate fully within the giftedness theoretical framework; instead, they rely on student selection processes based on academic achievement and specialized aptitude tests. Science high schools target students excelling in mathematics and science, social sciences high schools seek proficiency in literature, history, and social studies, and sports schools emphasize physical talent (bodily-kinesthetic intelligence). The misalignment of these institutions with giftedness theory is evident in their reliance on achievement tests and aptitude exams rather than IQ assessments (Bolat, 2020). The literature underscores SACs's central role in gifted education in Türkiye, while noting that other school types pursue a broader mission of competency development, indicating a concentrated focus on SACs for the identification and support of giftedness (Birgili & Çalık, 2013; Kaya, 2013).

Although science high schools, social sciences high schools, and sports schools are regarded as prestigious within Türkiye's education system, the objective measurement of intellectual capacity—a core component of giftedness theory, typically assessed via IQ tests—is not a selection criterion in these institutions. Admission to science high schools depends on high performance in centralized exams like the Entering Exam To High School (LGS), while social sciences high schools follow a similar academic performance-based evaluation. Sports schools, conversely, prioritize physical aptitude tests, often assessing students' early inclinations toward sports through practical examinations (Avcı-Doğan & Tamul, 2024). These processes reflect a performance-based approach rather than the standardized intelligence tests (e.g., Wechsler Intelligence Scale or Stanford-Binet) frequently emphasized in international literature. According to Renzulli's Three-Ring Model, giftedness encompasses not only academic success but also creativity and task commitment; yet these school types in Türkiye do not fully adopt this multidimensional framework. Sak et al. (2015) highlight the importance of differentiated curricula in gifted education, arguing that science high schools and similar institutions adhere to standardized curricula, offering a system centered on "high achievement" rather than giftedness. Internationally, programs like Gifted and Talented Education (GATE) in the United States integrate IQ tests and multiple assessment methods (Young & Balli, 2014), whereas in Türkiye, such systematic approaches are largely confined to SACs. Consequently, while SACs dominates the support of intellectual and artistic talents, other school types prioritize success in specific domains over a comprehensive giftedness paradigm.

Educational and Other Rights of Gifted Children

In Türkiye, gifted children are recognized as individuals requiring special education and are accordingly entitled to various educational rights (MEB, 2022). Managed by the Ministry of National Education (MoNET), SACs serve as a

primary mechanism for supporting these students. Admission to SACs typically occurs at the primary school level through teacher observations followed by standardized intelligence tests, enabling students to access differentiated educational programs tailored to their individual abilities. Furthermore, the “Support Education Directive” issued in 2015 allows gifted students to receive additional support in Support Education Rooms (SER) (MoNET 2015). SERs provide individualized or small-group activities within the school environment to enhance students’ potential, encouraging teachers to employ specialized educational strategies (Ünveren, 2025). While the literature notes implementation challenges for teachers in meeting gifted students’ needs through SERs, these structures are considered a vital step toward educational equity (Dursun et al., 2023; Yıldırım et al., 2024; Yıldız & Atamtürk, 2024). Beyond this, extracurricular opportunities such as summer schools and science Olympiads organized by institutions like TÜBİTAK are included within the educational rights framework, further supporting these students’ academic growth.

The rights of talented children extend beyond educational provisions to include additional benefits, such as the national athlete status, which facilitates talent development (Resmi Gazete, 2020). Students demonstrating exceptional ability in sports may be designated “national athletes” by the Ministry of Youth and Sports, granting them various privileges. As of 2023, national athletes receive bonus points for university admissions and, in some cases, direct entry into higher education programs without examination requirements. Sports scholarships and opportunities to represent Türkiye in international competitions also bolster the development of their bodily-kinesthetic intelligence (Ministry of Youth and Sports, n.d.). However, it should be noted that these rights are tied to athletic achievement rather than directly aligned with giftedness theory.

Orientation of Gifted and High-Achieving Students and Their Families Toward Talent Domains

In Türkiye, the orientation of gifted and high-achieving students toward talent domains is predominantly shaped by families’ pursuit of economic security and societal values. Professions such as medicine and engineering, which promise high income, are favored by both students and their families (Brown, 2002). This trend may stem from the exam-centric nature of the education system and families’ desire to secure their children’s financial future. Science high schools, targeting students excelling in mathematics and science, base admission on success in centralized exams. A study of final-year medical students reveals that job security, prestige, and financial rewards are key factors in career preferences, with family guidance and societal expectations significantly influencing their choices (Genç et al., 2007; Tengiz & Babaoğlu, 2020).

The career selection processes of gifted students are typically guided by their academic strengths, steering them toward disciplines where they demonstrate proficiency (Davaslıgil, 2004). For instance, success in science or mathematics often draws them to related fields. Their career development, like that of others, is a dynamic, lifelong process spanning early childhood through adolescence and adulthood. The career planning and occupational choices of gifted individuals are influenced not only by academic achievement but also by factors such as personal interests, family expectations, gender-based societal norms, and socioeconomic conditions. Marshall (1981) emphasizes the critical role of environmental actors—teachers, career counselors, school administrators, and peers—in shaping these decisions. In countries like Türkiye, where societal values are prominent, family guidance often directs students toward prestigious or financially rewarding professions over individual interests. However, these multifaceted influences can lead to uncertainty or indecision in career choices. Greene (2003) notes that gifted individuals frequently experience feelings of being “lost” or “directionless” in career planning due to a mismatch between their broad talents and societal expectations. Emmett and Minor (1993) further suggest that young adult gifted individuals struggle to balance personal values with external pressures, potentially resulting in confusion. Thus, the career development of gifted students unfolds within a complex interplay of internal motivations and external forces. Çiftçi (2020) highlights the prevailing tendency of families to steer children toward “guaranteed” fields like medicine.

The orientation of gifted and high-achieving students in Türkiye toward artistic domains remains less preferred compared to other career paths. While SACs offers individualized programs in music, visual arts, and creative drama to nurture artistic talents, these opportunities are generally framed to support personal development rather than professional careers (Ataman, 2009). Research on Fine Arts High Schools indicates that artistic orientation is shaped by

families' cultural capital and teachers' early recognition of talent, with familial artistic backgrounds and childhood socialization in arts playing pivotal roles (Sankır & Sankır, 2019). Nevertheless, gifted students' interest in arts is often curtailed by families and communities perceiving the field as economically insecure and lacking societal prestige. The societal inability to associate arts with financial success reinforces families' inclination to guide children toward "safer" fields, hindering the career-oriented realization of artistic potential among gifted individuals. The course and field selection, as well as career preferences of gifted primary school students, are subject to various adverse factors, including gender discrimination, uncertainties about a profession's future, economic conditions, and pressures from family and surroundings (Sürücü et al., 2015). In a context like Türkiye, where societal norms are robust, these influences often shift students' focus from individual interests and talents toward external expectations.

Conclusion

Giftedness represents a multidimensional construct, encapsulating individuals' capacity to exhibit superior performance across domains such as academics, arts, leadership, and creative problem-solving relative to their peers. This study demonstrates that theoretical frameworks, including Renzulli's Three-Ring Model, Gardner's Theory of Multiple Intelligences, and Sternberg's Theory of Successful Intelligence, provide a foundational lens for defining and fostering giftedness. The historical evolution from Galton and Terman's cognitive-focused studies to Subotnik et al.'s (2011) contemporary emphasis on talent development as shaped by environmental support and personal effort underscores the dynamic nature of giftedness. Neuroscientific evidence reveals that increased gray matter volume in the prefrontal cortex and parietal lobes of gifted individuals enhances cognitive flexibility and creative thinking (Geake, 2009). However, the manifestation of this potential is intricately tied to cultural values and societal norms.

In Türkiye, the education of gifted individuals is systematically supported through SACs, while science high schools, social sciences high schools, and sports schools focus primarily on academic achievement and specific competencies. Although SACs plays a significant role in developing intellectual and artistic talents, other school types do not fully align with giftedness theory, relying on performance-based selection rather than IQ tests (Sak et al., 2015). The educational rights of gifted children, recognized by the MoNET, encompass special education provisions and advantages like national athlete status, though these are often limited to success in specific domains. The orientation of gifted students and their families toward talent domains is shaped by economic security concerns and societal expectations, prioritizing prestigious fields like medicine and engineering, while arts are sidelined due to perceived economic risks (Sankır & Sankır, 2019; Çiftçi, 2020). These dynamic reveals adverse influences on career choices, including gender discrimination, occupational uncertainties, and family pressures (Sürücü et al., 2015).

In conclusion, realizing the full potential of gifted individuals in Türkiye necessitates an education system bolstered by differentiated curricula, multifaceted assessment methods, and policies enhancing family awareness. Translating theoretical models into practical applications requires a holistic approach that embraces not only academic success but also creativity, leadership, and artistic proficiency. Such an approach would unlock the transformative impact of gifted individuals at both individual and societal levels.

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