Weiterbildung zum ECHA Diploma of Advanced Studies
Specialist in Gifted Education

an der Westfälischen Wilhelms-Universität Münster

ECHA 24

- Diplomarbeit -

Erwerb und Aufrechterhaltung der Exekutivkraft:
Befähigung von hochbegabten Studierenden und Doktoranden
zu Motivation und Lernstrategien.

Obtaining and Maintaining Execution Power:
Exploring learning strategies and motivation
of gifted (PhD-) students in (post-)higher education.

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I dedicate this „ECHA-24 Diplomarbeit" to my family and friends.
Thank you for your support and for making me 'see' and understand,
even those parts that cannot be put into words.

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List of abbreviations

Gc	Crystallized intelligence (Cattell/Horn).
Gf	Fluid intelligence (Cattell/Horn).
HB-HO	Giftedness in Higher Education (NL); "Hoogbegaafd Hoger Onderwijs".
HBO	Hoger BeroepsOnderwijs – University for Applied Sciences.
IHBV	Instituut Hoogbegaafde Volwassenen (Institute for Gifted Adults)
IQ	Intelligence Quotient.
LSM	Learning Styles Model (Vermunt).
MBO	Middelbaar BeroepsOnderwijs - Vocational Schools.
OE	Overexcitabilities (Dąbrowski).
PBL	`Problem Based Learning
Ph.D.-candidates	Candidate to become a Doctor of Philosophy.
SDT	Self-Determination Theory (Ryan & Deci).
SRL	Self-Regulated Learning.
TIQ	Total Intelligence Quotient.
WO	Wetenschappelijk Onderwijs – Academia/ University.

Zusammenfassung

Diese Diplomarbeit untersucht Strategien zur Unterstützung hochbegabter Studentinnen und Studenten sowie (Post-)Doktorandinnen und (Post-)Doktoranden. Sie behandelt kognitive, emotionale und soziale Herausforderungen dieser Gruppe und zeigt eine Lücke in der spezialisierten Unterstützung nach der Sekundärschule auf. Die Forschung überprüft Modelle von Intelligenz und Hochbegabung und betont die Notwendigkeit bedeutungsorientierten Lernens und selbstregulierter Strategien.

Empirische Untersuchungen zeigen, dass Hochbegabte oft Schwierigkeiten haben, Studium und Wohlbefinden zu balancieren, Motivation zu managen und mit starren Bildungssystemen umzugehen. Manche erleben Burnout, Isolation und Frustration mit standardisierten Bewertungen. Die Arbeit plädiert für maßgeschneiderte Interventionen wie flexible Lehrpläne und personalisiertes Mentoring.

Die Studie empfiehlt, dass postsekundärer-Unterricht die komplexe Entwicklung hochbegabter Studierender anerkennen und unterstützende Umgebungen schaffen sollten. Sie befürwortet personalisierte, flexible Lernumgebungen, um Hochbegabten zu helfen, ihr volles Potenzial in Bildung und Beruf auszuschöpfen.

Abstract

This thesis explores strategies to support gifted students and PhD candidates in higher education. It addresses the cognitive, emotional, and social challenges these individuals face, highlighting a gap in specialized support at post-secondary levels. The research reviews various models of intelligence and giftedness, emphasizing the need for meaning-directed learning and self-regulated strategies.

Empirical research reveals that gifted students often struggle with balancing academics and well-being, managing motivation, and coping with rigid educational systems. Some experience burnout, isolation, and frustration with standardized assessments. The thesis argues for tailored interventions such as flexible curricula, personalized mentoring, and project-based learning to address these challenges.

The study concludes that higher education institutions should recognize the complex development of gifted individuals and provide supportive environments fostering both academic and personal growth. It advocates for a shift towards personalized, flexible learning environments to help gifted students reach their full potential in educational and professional settings.

Samenvatting

Deze *Diplomarbeit* onderzoekt strategieën ter ondersteuning van hoogbegaafde studenten en promovendi in het hoger onderwijs. Het richt zich op de cognitieve, emotionele en sociale uitdagingen waarmee deze individuen worden geconfronteerd, en benadrukt een lacune in gespecialiseerde ondersteuning na de middelbare school. Het onderzoek bespreekt verschillende modellen van intelligentie en hoogbegaafdheid, met nadruk op de behoefte aan betekenisgericht leren en zelfregulerende strategieën.

Empirisch onderzoek toont aan dat hoogbegaafde studenten vaak worstelen met het balanceren van academische prestaties en welzijn, motivatiebeheer, en het omgaan met rigide onderwijssystemen. Sommigen burn-out, isolatie en frustratie met gestandaardiseerde beoordelingen. Het onderzoek pleit voor op maat gemaakte interventies zoals flexibele curricula, persoonlijke mentor en projectmatig leren.

De studie concludeert dat hoger onderwijs instellingen de complexe ontwikkeling van hoogbegaafde individuen moeten erkennen en ondersteunende omgevingen moeten bieden die zowel academische als persoonlijke groei bevorderen. Het bepleit een verschuiving naar gepersonaliseerde, flexibele leeromgevingen om hoogbegaafde studenten te helpen hun volledige potentieel te bereiken in onderwijs en werk.

1 Introduction

While there is increased awareness about high giftedness, the reality is ambiguous. Indeed, more people are recognized for their abilities, the topic is raised at teachers' colleges, and more studies on coaching those with high abilities emerge. The general focus in literature and research on high ability seems to be on young children (Hamsikova, 2016; Kieboom, 2016; Kieboom & Venderickx, 2020b; Lammers van Toorenburg, 2005; van Olphen, 2022) and their experiences/challenges in primary schools (van Vlokhoven, 2019, 2023) and secondary schools and the possible need for special education among peers (Terpstra, 2023). This is followed by a growing body of literature on managing expectations and providing appropriate course materials for secondary school students (Hamsikova, 2020; Kieboom, 2016; Kieboom & Venderickx, 2020a). Another focus lies with adults experiencing difficulties in their work environment (Bos, 2021) or how to deal with gifted older people (Jelier, 2024; van de Ven & Nauta, 2022b).

However, the recent study by Scaliq in 29 primary schools, testing 5371 pupils, shows the sad reality (Scaliq, 2024a). They say that 56% of boys but only 38% of girls are identified as being gifted by their teachers, while there is a false positive of 14% for boys and 8% for girls who have an IQ in the lower 80% (Scaliq, 2024b). This research shows that in the case of a migrant background, especially if it is a non-Western background, the chances of being recognized for their abilities drop dramatically to but a 2% chance of recognition for girls from a non-Western migrant background (Scaliq, 2024b).

Although this research focuses on primary schools, it can be interpreted as symptomatic of (Dutch) society. Although traditionally a largely Calvinist society, this may still be the underlying tone despite increased secularisation; being different is not overly accepted. The Dutch government has launched various programs to ensure that children attend mainstream schools together rather than special schools. Two of them stand out. Firstly, 'Samen naar school' (Together to school) promotes inclusive education, which allows children with a higher need for support to be educated in a regular school (*Elk kind kan leren met inclusief onderwijs*, n.d.). Secondly, since August 2013, the law on 'fitting education' (passend onderwijs) (Ministerie van Onderwijs, 2013) and the activities developed as a result for both primary and secondary schools

to reduce bureaucracy and provide children with the care they need to reach their potential as far as possible in regular education. Schools are to be explicit in what kind of needs they specialize in, but, at the same time, are seemingly free to spend the additional budget they receive to cater to their students' needs (Ministerie van Onderwijs, 2010). While every one is equal, not everyone is the same, while these initiatives and their possible interpretations could—in the light of the Scaliq report—lead to a general assumption that education provides a one-size-fits-all for primary schools and, to some extent, even for secondary schools, despite the different 'streams' available. Indeed teachers agree that children can have other interests and needs, the step to provide for those students who may have an IQ>120 and particularly IQ>130 or more tends to stir emotions and reactions that Fleur Terpstra grasps in her book title those high gifted kids 'can learn on their own' or 'magically learn everything on their own' (Terpstra, 2023). It must be emphasized that this does not apply to all teachers or all schools.

In the Netherlands a significant number of students, specifically 8,311, are within the age group for compulsory education but are not attending any school for a period exceeding three months, a phenomenon commonly referred to as 'absenteeism' or 'home sitting'. Additionally, 8,422 students have been granted exemptions based on physical or psychological grounds (*Stijging in aantal thuiszitters*, 2024) according to research journalism of *Argos*. While these numbers seem high, they do not include what Loek Zonnenberg flagged in 2022 at least 5000 children that are not registered for attendance at school anyway because they either never enrolled – and are thus exempted from compulsory schooling or because they are at home with acknowledgment of the school they registered but have not been noted down as sick (Zonnenberg, 2022). Furthermore, Foundation *Balans* (Stichting Balans) flagged in 2020 already, estimating the number of homesitters to be around 15,000 (Boomsma, 2020) – new numbers are expected in December 2024.

The website of www.hbscholen.nl – which is an initiative of collaborating headmasters and parents of primary schools with full-time education for gifted students – estimates that 20-40% of these children that no longer attend any school are gifted and that this costs society between 150 and 200 million euros each year (*FAQ – HB Scholen*, n.d.). According to Stichting Balans, the children's ombudsman claimed

that in 2022, annual social costs ranged from €51,000 to €90,000-100,000 per child sitting at home (Zonnenberg, 2022).[1] Although this introduction may seem to deviate from the announcement of giftedness in higher education in the title, it illustrates two key points. First, there is generally an apparent inability to recognize giftedness. Second, more appropriate education must be provided for a group of students.

The difficulties encountered by individuals with high levels of intellectual ability, particularly in the context of primary and secondary education, underscore systemic issues that extend beyond the early education stage and persist into the higher education domain. The current focus on giftedness in younger children has contributed to a growing awareness of the issue. However, the lack of understanding and appropriate interventions in higher education remains largely unaddressed. As gifted students progress through the education system, their distinct learning needs are frequently not met, which can result in underachievement, demotivation, and even academic disengagement. The phenomenon of "home sitting," absenteeism, and misidentification in earlier education stages indicates that these students may continue to encounter similar obstacles as they transition to vocational or higher education settings (MBO, HBO, WO). This lack of recognition and support for the distinctive challenges faced by gifted students in higher education gives rise to an urgent question: how can the learning strategies and support structures required for gifted students in these advanced educational environments be more effectively addressed?

1.1 Research question

Given the gaps in the literature and the evidence of under-supported gifted students, it becomes crucial to explore interventions tailored to their unique cognitive and emotional needs. These students require more than just recognition; they need learning environments that foster motivation, promote effective metacognitive strategies, and address the risks of underachievement that can hinder their educational and personal growth. Moreover, they need to be recognized as human beings! The societal and educational costs of ignoring these needs are significant, both in terms of the lost po-

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[1] Interestingly, such calculations seem to be absent when it comes to gifted adults that do not reach their potential in a work environment.

tential of these individuals and the broader impact on innovation and societal progress. Therefore, this study seeks to address the critical question:

> *What cognitive, motivational, and emotional challenges hinder the execution power of gifted students, PhD candidates, and postdocs in higher education, and how can institutions provide support to enhance their learning and development?*

The term execution power stems from business administration and entails transforming ideas and strategies into actionable, measurable results. It is not just about *having a plan* but ensuring that the plan is carried out efficiently and leads to success. While it is not (yet) standardly applied in education, it could well be used to explain discrepancies between originally being motivated and being bogged down by institutional hassles, *or,* hopefully, being able to fulfill one's plans effectively and successfully. The question invites exploration into the theoretical underpinnings of motivation and learning strategies, examines the challenges of gifted learners, and seeks to identify evidence-based strategies to support their educational journey. This question aims to bridge the gap between theory and practice, contributing through an explorative study (some) valuable insights for educators, policymakers, and students.

1.2   Structure of the thesis

The structure of this thesis is designed to provide a comprehensive exploration of the challenges and needs of gifted students in higher education, with a particular focus on learning strategies and interventions. The work is organized into several interconnected sections that guide the reader through thoroughly examining the topic. Following the introduction, the first major section, "Giftedness: Models, Theories, and Definitions," delves into the theoretical foundations of giftedness. This part of the thesis reviews multiple models and perspectives, including various intelligence theories and psycho-social system models. It examines key frameworks such as Spearman's g-factor, Gardner's Theory of Multiple Intelligences, Renzulli's Three-Ring Model, and Dąbrowski's Theory of Positive Disintegration. By exploring these diverse viewpoints, this section lays a robust theoretical groundwork for understanding the complex and multifaceted nature of giftedness.

The second main theoretical section, "Educational Needs and Strategies," builds upon this theoretical base to explore the specific learning styles, motivational factors, and time management needs of gifted students. It contrasts traditional learning models,

such as Kolb's Experiential Learning Theory and Vermunt's Learning Styles Model, with the unique requirements of gifted learners. This section highlights how gifted individuals often demonstrate advanced self-regulation, intrinsic motivation, and metacognitive skills, which are not always adequately addressed by conventional educational approaches. The discussion in this part offers theoretical insights into how learning environments can be adjusted to better support the needs of gifted students.

The thesis then transitions to its empirical research component, which presents the results of two surveys conducted with gifted students, PhD-candidates, and postdoctoral researchers. This section provides valuable insights into the personal experiences of these individuals, exploring their perceptions of giftedness, the support available to them, and the challenges they face in higher education. The analysis of the survey results identifies key themes, including the emotional and cognitive struggles of balancing academic work with personal well-being, frustrations with rigid educational structures, and the unique social and emotional sensitivities experienced by many gifted individuals. Following the empirical research, the thesis includes a reflective section that synthesizes the findings from both the theoretical and empirical analyses. This reflection emphasizes the importance of creating flexible, supportive educational environments that cater to the specific needs of gifted students. It argues for the integration of personalized learning strategies, project-based learning, and mentorship to foster both academic and personal development.

This final part outlines specific interventions to enhance motivation, promote self-regulated learning, and provide gifted students with emotional and psychological support. By addressing the educational and emotional dimensions of giftedness, the thesis offers a holistic approach to improving educational outcomes for gifted individuals in higher education. Through this structured approach, the thesis aims to provide a comprehensive understanding of giftedness in higher education, from theoretical foundations to practical applications, ultimately contributing to developing more effective support systems for gifted learners.

2   Giftedness: models, theories, and definitions

Giftedness is a multifaceted concept with numerous definitions in academic literature. Theories vary in their approach, with some viewing giftedness as general high intelligence, while others consider it domain-specific potential or a guarantee of performance (Gardner, 2005). The threshold for giftedness is generally laid at 130 IQ

points – the Mensa-norm (Hofstede & Meerman, 2003). However, questions do arise as to whether this is not a strict norm, as creativity could outperform the higher IQ. Moreover, having a high IQ is not the only factor that determines achievements (Müller-Oppliger, 2021; Stern & Schumacher, 2004; Weinert, 2000). Despite the complexity and diversity of perspectives, researchers have a growing consensus that giftedness is complex, domain-specific, and dynamically developing but influencing each other's approaches (Dai, 2018). This evolving understanding of giftedness has implications for identifying, educating, and supporting gifted individuals across various fields and stages of life.

Recently, the term 'neurodiversity' has been used for all with a somewhat different way of thinking and different needs in this regard. However, as this is often linked to the DSM (Diagnostic and Statistical Manual of Mental Disorders), and giftedness is *not* a mental disorder, this term is neither applied nor used.

2.1   Theoretical approaches to giftedness

The field of giftedness can be broadly divided into three interrelated categories of research. Firstly, the initial focus is on determining intelligence through IQ tests, which seek to quantify cognitive abilities using standardized measures. Secondly, the psychosocial approach emphasizes the interaction between intellectual abilities and external factors, such as family, school, and peer relationships. This perspective acknowledges that giftedness manifests in diverse ways and is shaped by social environments. Thirdly, practical, personal experience addresses how individuals perceive their abilities, challenges, and intensities, often exploring subjective aspects of giftedness. The following sections will explore these three approaches, examining their underlying theories and implications.

2.1.1   Intelligence research, domain modelling

In the field of intelligence, several models have been proposed to elucidate the structure of cognitive abilities and the means of measuring them. These models can be classified into two principal categories: general and specific intelligence models.

2.1.1.1 Domain General Models of Intelligence

The general factor theory, which is more commonly referred to as the g-factor, was initially proposed by Charles Spearman. Spearman observed a correlation between performance on one type of cognitive task and performance on others. This led him to hypothesize that there was a single, underlying factor influencing overall intellectual performance. The general intelligence factor, or g-factor, reflects an individual's capacity to perform various cognitive tasks. Spearman's theory significantly contributed to the field, as it introduced the concept of a singular measure of intelligence that could be applied across various domains. This model proposes that intelligence is not domain-specific but rather represents a unified construct that affects all areas of cognition (Spearman, 1904; Sternberg, 2018).

Another prominent figure in this field, Lewis Terman, made a significant contribution to general intelligence theory through his work on the Stanford-Binet Intelligence Scale. Terman refined the original Binet-Simon scale to develop a more effective instrument for assessing intelligence in a standardized manner. Terman postulated that intelligence could be quantified and that individuals with high IQ scores were likelier to succeed. His adaptation of the IQ test emphasized the concept of quantifiable general intelligence that was not confined to a specific skill set but instead represented an overarching cognitive ability (Sternberg, 2018; Terman, 1916).

2.1.1.2 Domain-Specific Models of Intelligence

In contrast with the concept of a unified g-factor, L.L. Thurstone put forth a model of intelligence that emphasized the role of specific abilities instead of a singular general factor. In his Primary Mental Abilities theory (1938), Thurstone proposed that intelligence comprises some discrete factors, including verbal comprehension, numerical ability, spatial relations, memory, and reasoning. He posited that intelligence is multidimensional, such that an individual may excel in one area while demonstrating average performance in others. This suggests that intelligence cannot be reduced to a single general factor.

Building upon Spearman's g-factor, Raymond Cattell and John Horn proposed a revised model that differentiated between two types of intelligence: Fluid intelligence (Gf) and crystallized intelligence (Gc), which are two distinct forms of intelligence (Cattell, 1963; Horn, 1968). Fluid intelligence is the capacity to think logically and

solve novel problems independently of acquired knowledge. In contrast, crystallized intelligence reflects the knowledge and skills accumulated over time through learning and experience. Cattell and Horn's model contributed to advancing intelligence research by recognizing that cognitive abilities can change over the lifespan. Specifically, fluid intelligence is thought to peak in early adulthood, while crystallized intelligence continues to develop throughout life.

In conclusion, Howard Gardner presented the Theory of Multiple Intelligences, which contested the conventional notion of intelligence as a singular phenomenon (Gardner, 2005). Gardner identified at least eight distinct types of intelligence, including linguistic, logical-mathematical, musical, spatial, bodily-kinaesthetic, interpersonal, intrapersonal, and naturalistic intelligence. Following Gardner's theory, individuals exhibit disparate levels of these intelligences, which may not be correlated with one another. His model underscores the heterogeneity of human capabilities and posits that conventional IQ tests, which predominantly assess linguistic and logical-mathematical abilities, fail to encompass the comprehensive spectrum of human intelligence. The implications of Gardner's theory for education are profound, suggesting that teaching methods should be tailored to address the diverse strengths of learners.

2.1.2   Psycho-social, system modelling
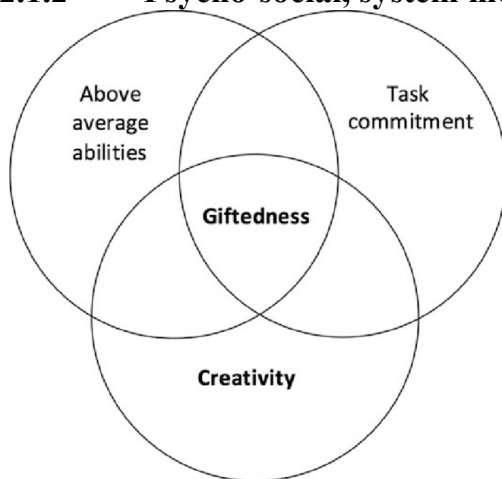
2.1.2.1   System Models of Intelligence

Figure 1 Renzulli's three-ring model of giftedness (Renzulli, 2004).

System models of intelligence posit that intellectual abilities are contingent upon many interacting factors. Joseph Renzulli's Three-Ring Conception of Giftedness is a noteworthy model in this domain. This model posits that giftedness emerges from the interplay of three key elements: above-average ability, creativity, and task commitment. Renzulli's model posits that giftedness is not contingent on intellectual ability alone but rather on how individuals deploy their creativity and commitment to addressing real-world challenges (Renzulli & Reis, 2018). The Three-Ring Model

posits that intelligence is part of a dynamic system whereby each ring influences the others, enabling individuals to excel in specific domains when these factors are aligned.

2.1.2.2   Developmental Models of Intelligence
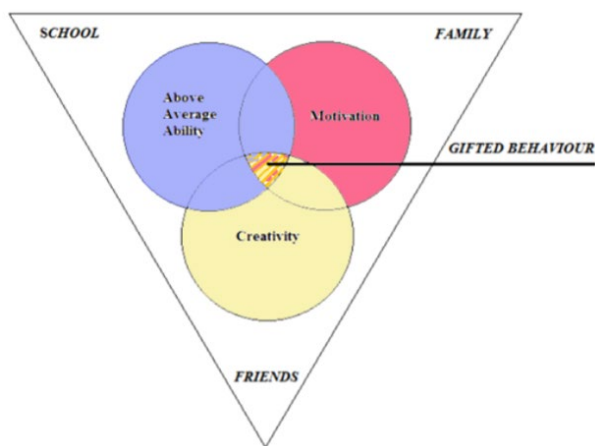
Figure 2 Mönks' Triadic model of interdependence (Mönks, 1992)

A developmental approach to intelligence posits that it is a dynamic process shaped by environmental and personal factors over time. Franz Mönks built upon Renzulli's work by introducing the Triadic Interdependence Model (1992). This model incorporates environmental factors, including family, peers, and school, in addition to the three original components of Renzulli's mo-del. Mönks' model emphasizes that high ability, creativity, and task commitment must be nurtured in conducive environments to develop giftedness. He emphasizes the role of social context in facilitating or impeding the expression of intellectual and creative potential, acknowledging the importance of supportive relationships with family and peers.

The Munich Model of Giftedness by Kurt Heller and Christoph Perleth builds upon this interactionist approach by outlining how both cognitive and non-cognitive factors, including personality traits and environmental influences, interact to foster exceptional performance (Heller & Perleth, 2008). The model delineates many domains of intelligence and skill, including academic, artistic, and athletic talents, and elucidates how these are shaped by factors such as motivation, self-concept, and social support systems. Heller's work emphasizes identifying and promoting giftedness by implementing bespoke educational strategies.
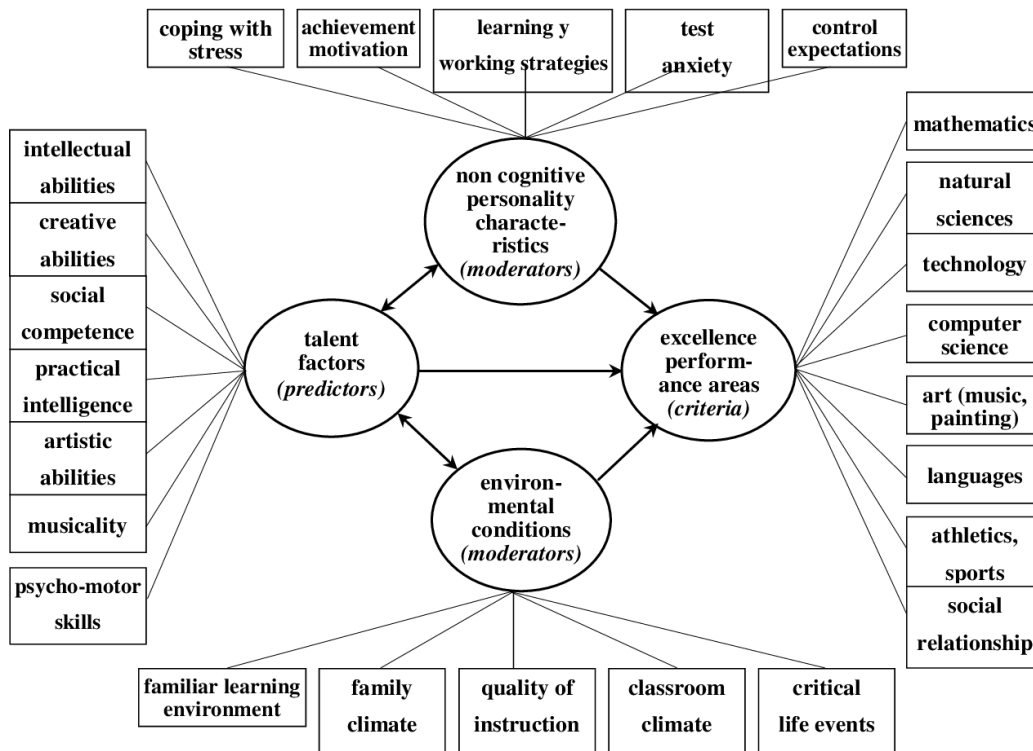
Figure 3 The Munich Model of Giftedness (MMG) (Heller & Perleth, 2008).
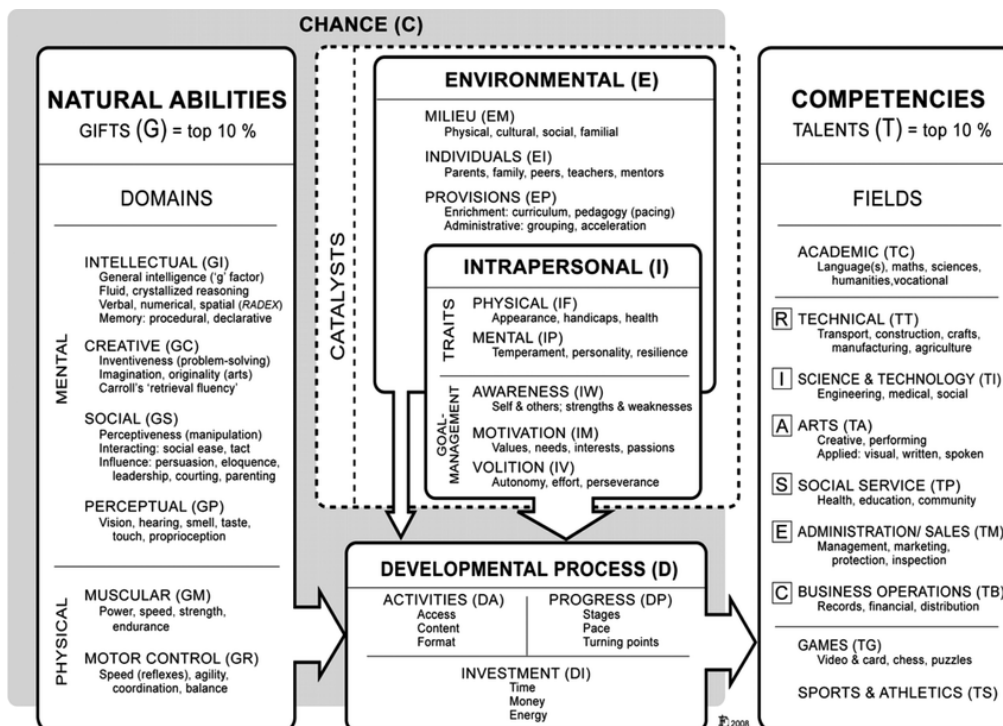
Figure 4 Gagné's DMGT (Gagné, 2008).

Gagné's Differentiated Model of Giftedness and Talent (DMGT) (2008) further develops this concept by distinguishing between "gifts" (natural abilities) and "talents" (developed skills) . Gagné posits that environmental factors, intrapersonal factors

(such as motivation), and developmental processes interact to transform innate gifts into actual talents. His DMGT provides a structured approach to understanding how innate potential can be systematically developed into high-level expertise, emphasizing that talent development is an ongoing process that requires supportive environments.

Finally, Fischer's Integrative Model of Giftedness and Learning Processes (2021) offers a dynamic and systemic perspective. Fischer posits that giftedness is not a fixed trait but a dynamic phenomenon that can evolve through interactions between cognitive abilities, environmental influences, and personal motivations. His model elucidates how learning environments, such as schools and families, can foster or inhibit giftedness's development by providing the necessary resources and support for talent to flourish. Fischer's model focuses on the ongoing interaction between potential and performance, underscoring the evolving nature of giftedness over time.
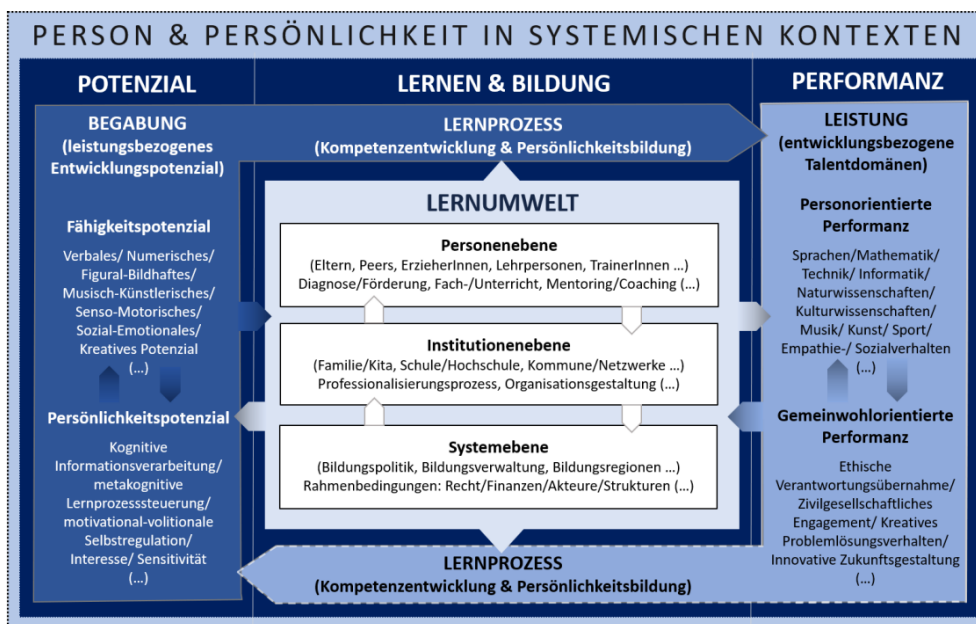
Figure 5 Fischer-model of person and personality in systematic contexts (Fischer et al., 2021, p. 29)

2.1.3   Practical, personal percipience modelling

This section will examine several models that emphasize the personal experiences of gifted individuals, offering valuable insights into their emotional, cognitive, and social worlds. Dąbrowski's Theory of Positive Disintegration (with its focus on overexcitability), the Asynchronous Development Model, the Delphi Model, and the Fluid Model for exceptionally gifted people, Competence development and two Soffos tests will be discussed to highlight how these frameworks provide a voice for the rich and

often complex inner lives of gifted people. These models transcend the conventional metrics of giftedness, such as IQ, by centering on the personal perceptions, emotional intensity, and developmental asynchronies many gifted individuals encounter. Examining these approaches aims to encapsulate the multifaceted essence of giftedness and how it is experienced and interpreted by those who exemplify it.

2.1.3.1   Dąbrowski's Positive Disintegration Theory

Kazimierz Dąbrowski's (1902-1980) Theory of Positive Disintegration (1964) is distinguished from other models of giftedness by its emphasis on personality development through periods of psychological tension, anxiety, and disintegration (Bok-van der Voet, 2023, pp. 32–58). While most psychological health models emphasize stability and integration, Dąbrowski proposed that personal growth may frequently emerge from disintegration, whereby individuals experience internal conflict and challenges that ultimately facilitate enhanced psychological development. This theory is distinctive in that it reframes mental struggles such as neurosis and anxiety as potentially beneficial forces for growth rather than indications of dysfunction.

The term "positive disintegration" indicates that the dissolution of one's psychological state is a prerequisite for attaining heightened levels of personality integration. Dąbrowski developed this theory based on his observations of individuals who, after facing crises, emerged with stronger, more autonomous personalities. These stages of disintegration are regarded as indispensable for transitioning from societal norms and automatic behaviour towards a self-directed and value-driven life. The theory proposed by Dąbrowski comprises five stages of personality development. Each stage represents a progression from instinctive, primitive behaviour to a more complex, autonomous, and value-oriented personality (Bok-van der Voet, 2023, p. 37). At Level 1, called Primary Integration, individuals are driven by fundamental impulses and adhere to social norms without internal conflict. At Level 2, Unilevel Disintegration, individuals begin to experience internal conflicts, albeit superficial ones, as they remain guided by external values. Level 3, Spontaneous Multilevel Disintegration, represents a shift toward forming internal hierarchies of values, accompanied by the experience of deeper emotional conflicts and self-reflection. At Level 4, Organized Multilevel Disintegration, individuals consciously reconstruct their values, integrating them into a unified personal framework. Finally, Level 5, Secondary Integration, rep-

resents the pinnacle of development, where individuals live by deeply internalized, self-chosen values, achieving a harmonious alignment between their ideals and actions.

Dąbrowski's concept of 'overexcitabilities' (OEs) is a pivotal element of his 'Theory of Positive Disintegration' (Bok-van der Voet, 2023, pp. 41–43). It provides a rationale for the amplified responses to stimuli frequently observed in numerous gifted individuals. These overexcitabilities are heightened sensitivities in five distinct areas: psychomotor, sensual, imaginational, intellectual, and emotional. These concepts help to elucidate why individuals with high cognitive ability often perceive the world more intensely, both in terms of their mental processes and emotional reactions.

The initial type, psychomotor overexcitability, denotes an augmented physical energy level and a proclivity for unceasing movement (Bok-van der Voet, 2023, pp. 49–51; Van Overbeke, 2019). Those who exhibit this form of OE may display restlessness and a tendency to seek out activity or motion. This elevated level of energy can result in challenges in conventional learning environments that necessitate stillness or extended periods of concentration, as these individuals may experience difficulty in regulating their physical impulses. However, this overexcitability can foster productivity and endurance when channelled appropriately.

Sensual overexcitability is characterized by an enhanced responsiveness to sensory stimuli, including auditory, visual, olfactory, and tactile experiences (Bok-van der Voet, 2023, pp. 51–54; Van Overbeke, 2019)Those with this form of OE frequently derive considerable pleasure from aesthetic experiences such as music, art, and nature. However, they may also be susceptible to being overwhelmed by unpleasant stimuli, including loud noises and uncomfortable textures. This heightened sensual awareness can create challenges in overly stimulating environments, but it also contributes to a deep appreciation for beauty and aesthetics.

The third type, imaginational overexcitability, is characterized by a rich and vivid imagination (Bok-van der Voet, 2023, pp. 47–49; Van Overbeke, 2019). . Individuals with this trait frequently engage in complex daydreams, fantasies, and creative thought processes. Such individuals may tend to blur the boundaries between reality and imagination, which can foster creativity and innovation. However, this may also result in distraction or difficulty in concentrating on tasks at hand. This imaginative

capacity enables the utilization of distinctive problem-solving methodologies and artistic expression, constituting a pivotal asset in creative pursuits.

Those with intellectual overexcitability display an intense curiosity and a desire to seek knowledge, understanding, and truth (Bok-van der Voet, 2023, pp. 44–46; Van Overbeke, 2019). Those with intellectual OE are frequently engaged in critical thinking, problem-solving, and pursuing theoretical or abstract knowledge. Such individuals flourish in environments stimulating their cognitive abilities, yet may experience frustration in settings that do not challenge their intellectual capacity. This overexcitability catalyzes intellectual growth; however, it can occasionally result in feelings of alienation if others cannot maintain pace with their accelerated cognitive processes.

Emotional overexcitability refers to the experience of emotions with exceptional depth and intensity (Bok-van der Voet, 2023, pp. 54–56; Van Overbeke, 2019). Individuals with emotional OE display high levels of empathy and sensitivity and the capacity to form deep emotional connections. Such individuals frequently experience a wide range of emotions, from profound joy to intense sadness, and can be profoundly affected by their surroundings or the experiences of others. While this emotional depth contributes to a rich inner life and the ability to form meaningful relationships, it can also render these individuals more susceptible to emotional overwhelm and mood swings.

Collectively, these overexcitabilities provide a framework for understanding gifted individuals' rich and complex inner lives. Such insights facilitate an understanding of the strengths (e.g., creativity, intellectual prowess, and empathy) and challenges (e.g., sensory overload or emotional volatility) that gifted individuals may encounter. This model highlights the necessity of acknowledging and facilitating the distinctive developmental trajectories of gifted individuals, as their heightened sensitivities contribute to their exceptional potential for personal growth and creative achievement.

The Positive Disintegration theory portrays the multifaceted and intricate inner world of individuals undergoing personal growth, particularly those gifted. It underscores that such growth frequently entails profound emotional and intellectual experiences. By integrating the concept of overexcitabilities, the model offers a perspective on why some gifted individuals may encounter personal crises with greater intensity – for example, burn-out (Bok-van der Voet, 2023, pp. 32–37). However, these crises are viewed as crucial for the development of a more integrated and elevated personality.

2.1.3.2 Asynchronous Development Model

The Columbus Asynchronous Development Model, developed by the Columbus Group in 1991 (Kane, 2019; Kreger Silverman, 1997), offers a distinctive perspective on giftedness by focusing on the uneven development often observed in gifted individuals. In contrast to traditional models emphasizing academic achievement or IQ, this model draws attention to the discrepancy between cognitive, emotional, and physical development. For example, gifted children may demonstrate intellectual abilities that exceed those typical for their age yet exhibit emotional regulation that aligns more closely with that of a younger child. This asynchrony gives rise to several challenges and vulnerabilities, particularly in social contexts where gifted individuals may feel out of step with their peers.

The model was named after the Columbus Group, a collective of parents, educators, and psychologists who sought to redefine giftedness through a phenomenological lens, focusing on the internal experiences of gifted individuals. The proposition was that the giftedness phenomenon is not solely a function of an elevated IQ, but rather a reflection of how advanced cognitive abilities and emotional intensity converge to create experiences that are qualitatively distinct from the norm. This redefinition emphasizes that gifted individuals may require distinctive forms of support within educational contexts and emotional and social domains.

The aims to address gifted individuals' social and emotional needs, which are frequently neglected in conventional gifted education programs. The objective of the model is to elucidate the reasons behind the tendency of gifted individuals to perceive themselves as different or alienated from their peers. This phenomenon can be attributed to the aforementioned developmental asynchrony. By emphasizing the discrepancies in their development, the model aims to foster a more profound comprehension and enhanced support for the emotional and psychological intricacies that

gifted individuals encounter, particularly the sentiments of being "out of sync" with their surroundings.

The model elucidates the multifaceted internal experiences of gifted individuals, encompassing their heightened sensitivity and intense emotional responses. However, this intensity also carries the potential for adverse outcomes, including social isolation, frustration, or anxiety, particularly when the external world fails to align with their advanced cognitive capabilities. The model proposes the implementation of more bespoke educational and psychological interventions that consider these asynchronous developmental trajectories, thereby ensuring that the needs of gifted individuals are addressed comprehensively.

2.1.3.3   Kieboom's Zijnsluik

Figure 7 Giftedness, consisting of 'thinking' and 'feeling' (Kieboom, 2016, p. 24).

In her work on Giftedness, Tessa Kieboom introduces a significant new dimension to the study of giftedness besides 'thinking/intelligence'; she focuses on the *Zijnsluik* (possible translation as the "being"-awareness). Rather than focusing solely on cognitive abilities, she turns her attention to gifted individuals' emotional and personal characteristics (Kieboom & Venderickx, 2020a, pp. 20–39). The prevailing models, such as Renzulli's or the cognitive frameworks, emphasize intelligence, creativity, and motivation. However, Kieboom posits that giftedness encompasses more than merely a high IQ. The *Zijnsluik* introduces the internal emotional and psychological traits that are particularly intense and distinct in gifted individuals, offering a more holistic understanding (van de Ven & Nauta, 2022c, p. 27).

The *Zijnsluik* identifies four key characteristics (See: Figure 8): The four key characteristics are perfectionism, a strong sense of justice, hypersensitivity, and a critical mindset. Perfectionism frequently gives rise to elevated expectations and an apprehension of failure, whereas a sense of justice engenders a profound dedication to equity, which may occasionally manifest as confrontations. The term "hypersensitivity" denotes an increased sensitivity to emotional and sensory experiences, which results

in gifted individuals perceiving the world more profoundly. Lastly, the critical mind-set is characterized by a tendency to question and be unwilling to accept information at face value. This can present challenges in authority-driven environments, such as schools.

The *Zijnsluik* aims to assist educators, parents, and gifted individuals themselves in recognizing that these traits are not merely a consequence of intelligence but are, in fact, central to their identity and development. Focusing on the experience of feeling different is particularly important, as many gifted individuals grapple with this sense of otherness, which can result in social isolation or misdiagnosis of behavioural issues. The objective of the model is to facilitate more effective personal development and the creation of more conducive environments for gifted individuals.

Figure 8 'Zijnsluik' ('Being') showing 'perfectionism, feeling of justice, high sensitivity and critical awareness' (van Kooten-Sinke, n.d.).

The *Zijnsluik* models represent an attempt to illustrate the richness of the internal experiences of gifted people. The model acknowledges the dual nature of these traits, acknowledging both their beneficial and detrimental aspects. For instance, it recognizes that perfectionism can lead to fear of failure, while hypersensitivity can cause emotional overwhelm. The model thus serves as a practical tool for understanding the emotional depth and complexity of gifted individuals, providing insights that extend beyond intellectual ability into their personal and social lives.

2.1.3.4 Delphi Model

The Delphi Model of Giftedness is distinguished from other models by its focus on the experiential and existential aspects of giftedness, as opposed to an emphasis on cognitive abilities or achievements (van Thiel et al., 2019). In contrast to models that prioritize quantifiable characteristics such as IQ or academic achievement, the Delphi Model elucidates the personal experiences of gifted adults, emphasizing attributes

such as emotional intensity, creativity, and autonomy. It offers a comprehensive and enlightening perspective on how gifted individuals perceive and negotiate their giftedness in everyday life, considering both internal sentiments and external interactions (van de Ven & Nauta, 2022c).

The model derives its designation from the Delphi method, a qualitative research technique initially devised to achieve consensus among experts. In the case of the Delphi Model, this method was employed to solicit the input of 20 experts on the topic of giftedness throughout several iterative rounds (Verheul, 2019). These rounds comprised the gathering of expert input, the summarizing of findings, and the continued feedback until a consensus was reached. This process ensured that the final model reflected the collective insights and experiences of those who work closely with gifted adults, making the audience feel included and part of a community (van der Ven, 2021; van Thiel, 2015).

The Delphi Model's objective is to provide a practical instrument for gifted adults to comprehend better and express their personal experiences of giftedness more nuancedly. It addresses the shortcomings of traditional models, which are perceived as lacking practical applicability and disconnected from real-life experiences. The model is designed to be empowering and applicable in a counselling context, enabling gifted adults to recognize their strengths, understand the challenges they may face, and communicate their needs to others, both in personal and professional settings.
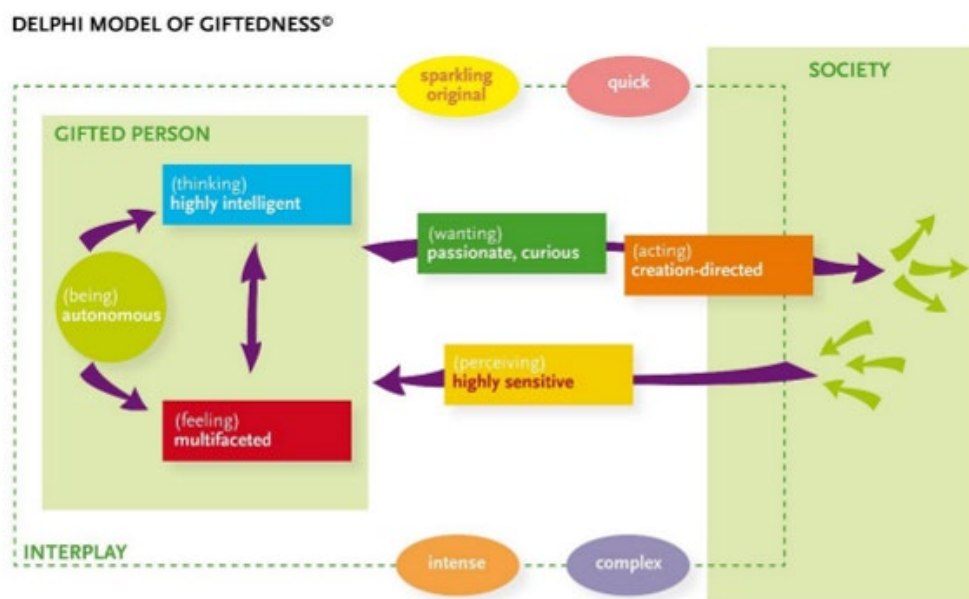
Figure 9 Delphi Model (van Thiel, 2015, p. 14; van Thiel et al., 2019)

Regarding the model's representation, the Delphi Model captures the nuances and intricacies of the gifted experience. The model encompasses a range of qualities, including emotional sensitivity, multidimensional thinking, creativity, and autonomy (van Thiel et al., 2019). It emphasizes the distinct manifestation of these traits in each individual and the interplay between internal experiences and external environments. It illustrates how gifted individuals process and respond to the world around them in a manner that is uniquely "gifted" in nature.

2.1.3.5   Competence-development

In their study, Noks Nauta and Rianne van der Ven examine the process of self-realization and the discovery of giftedness (van de Ven & Nauta, 2022a). The authors present three theoretical frameworks that seek to elucidate this process. The initial model, as proposed by Lisa Erickson in "Coming Out Gifted," delineates a trajectory from the initial recognition of giftedness to the subsequent integration of this identity into daily life. This model places particular emphasis on the incremental acceptance and expression of giftedness in social contexts (van de Ven & Nauta, 2022a, p. 50).

The second metaphor involves attaining a "giftedness driving license" (van de Ven & Nauta, 2022a, p. 50). This analogy compares the discovery of giftedness to learning to drive a car with a more powerful engine than most people. It highlights the enhanced self-awareness and potential difficulties in regulating advanced capabilities that may be experienced by the individual in question.

The third framework is based on the Conscious Competence Learning Model (van de Ven & Nauta, 2022a, pp. 51–54). This model delineates four stages: unconscious incompetence, conscious incompetence, and conscious competence. The process is described as continuous, beginning with feelings of misunderstanding and external attribution of giftedness and culminating in self-management and personal growth. This progression illuminates the evolving nature of self-realization in gifted individuals, who become increasingly aware of their abilities and potential for growth and contribution. In the final stage, the focus shifts away from giftedness as a theme, and the individual operates with confidence and self-awareness.

2.1.3.6 Fluid Model for Exceptionally High Gifted

Renata Hamsikova of IeKu (Hamsikova, n.d.) goes even further with her *Fluid model for exceptionally high gifted* in which she not only says that a label does not grasp the core of giftedness, it is being used for recognition (Hamsikova, 2020). However, because others cannot and will not understand the full essence of giftedness, it can be harmful to one's self-esteem (Hamsikova, 2016). The model starts with the person itself and looks from there to the outside world, and the underlying idea is self-empowerment instead of connecting one's thoughts to the fears of others.
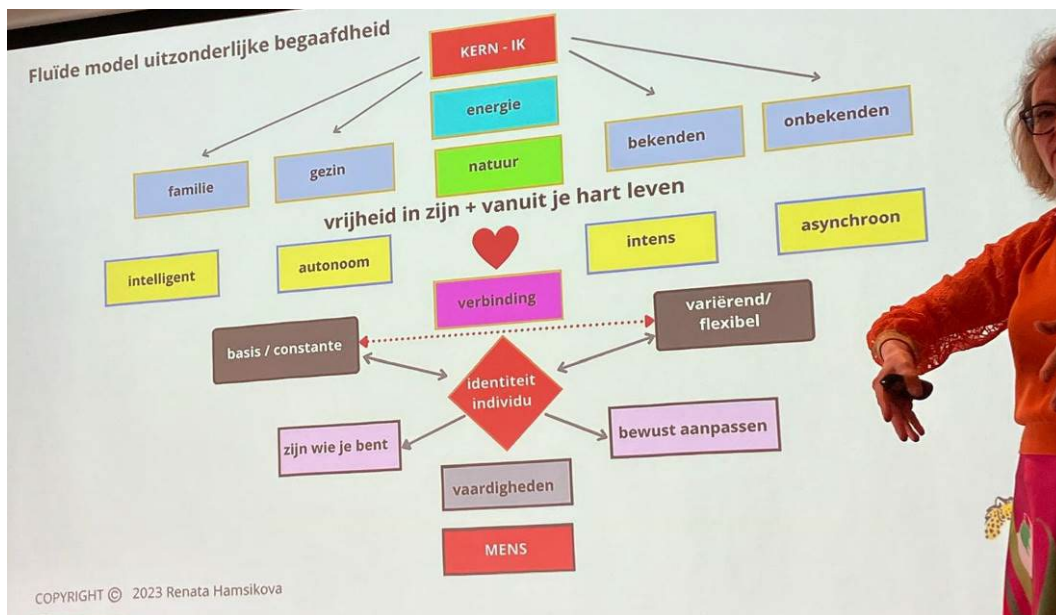
Figure 10 Fluid model for exceptionally high gifted (145+) by Renata Hamsikova (IeKu) at the Masterclass 'Vind jezelf terug'-dag voor hoogbegaafde vrouwen (12 May 2023).

Hamsikova's model taps into the transcendence, self-actualization, and aesthetic levels of Maslow's hierarchy of needs (Maslow, 1954). As such, her theory and model can be challenging to understand and accept. In her work *Intens, Authentiek en Vrij* (Intens, Authentic and Free), Hamsikova takes the somewhat eccentric approach of explaining things without considering the broader audience, but she focuses only on the (exceptionally) gifted reader. In other words, she does not dumb down her explanation so that "everyone will understand," but she speaks to equals. Hamsikova's model is essentially self-actualization (what a person can be, they must be), as it focuses on achieving what one can do and pursuing one's goals . The spiritual - or transcendence - needs are also included in the model but seem to get a little less attention (for now) as they seem to be included in energy.
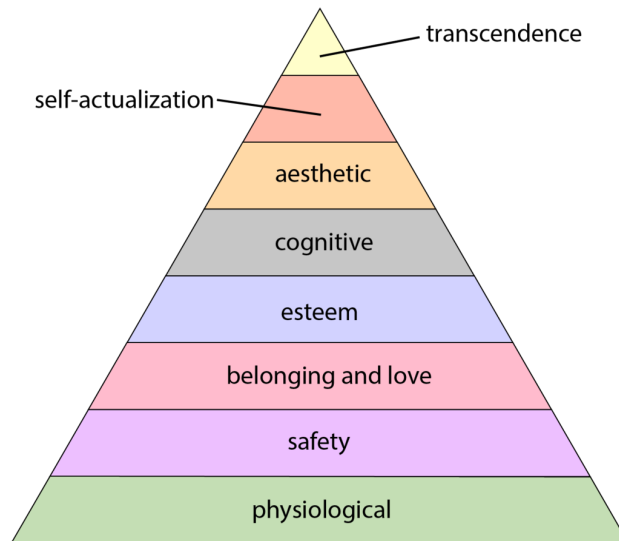
2.1.3.7 Soffos tests

In the context of practical, personal perception model-ling, which shifts the focus away from IQ-based or pure-ly psycho-social models to how one perceives and expe-riences their own giftedness, it becomes crucial for individuals to develop an aware-ness of their boundaries. This approach underscores the significance of self-regulation and self-care in navigating the emotional and cognitive intensity that frequently ac-companies giftedness. Gifted individuals must recognize and respect their boundaries to maintain their well-being. Due to their heightened sensitivity to their surroundings, gifted individuals may experience various positive and negative emotions.

When coupled with the extreme sensitivity that many gifted individuals exhibit, the self-awareness of these boundaries can often result in emotional or physical exhaus-tion. While intellectually stimulating, the constant awareness of one's environment may also result in depletion of energy levels and burnout if not managed carefully. It is, therefore, vital for individuals to be mindful of their limits and learn strategies to regulate their energy. This may include seeking professional help or guidance on how to navigate and manage such intensities, ensuring that these unique sensitivities do not overwhelm but are integrated into a healthy, balanced life.

Soffos (*Onderzoeksbureau Soffos*, n.d.) is a survey agency that offers innovative cog-nitive assessments and psychometric tests. Its expertise lies in developing tools that evaluate cognitive abilities, emotional intelligence, and personality traits, with a focus on supporting educational and professional development. These tests are designed to provide insights into an individual's intellectual strengths, weaknesses, and potential and are often tailored for use in both personal growth and organizational settings.

In collaboration with an occupational health physician, Soffos has developed two practical tests designed to assess self-regulation, self-care, and sensitivity to one's environment. While created in line with Dutch COTAN[2] standards, these tests have not undergone formal COTAN evaluation, as per the developer's preference. Consisting of 32 and 34 questions, the tests generate a score (1-100) and provide clear explanations and recommendations. These tools are particularly valuable for identifying potential risks of burnout or discomfort in professional and personal environments, with advice to consult specialists when needed. These tests benefit employees and could provide important insights for students on work-life balance and self-realization.

2.1.4 Features of Current Gifted Education Models

The conceptualization of giftedness has undergone a significant evolution, progressing from a static to a dynamic model that recognizes the intricate interplay of multiple factors in the development of exceptional abilities. The contemporary models of giftedness, as exemplified by the work of Fischer (2021), Gagné (2008), and Heller et al. (2008), build upon the foundational work of Mönks (1992)to incorporate environmental and personality characteristics as crucial determinants in the transformation of gifted potential into exceptional performance.

The aforementioned frameworks exhibit a number of key commonalities.

- The acknowledgment of environmental influences on talent development is a fundamental aspect of contemporary models of giftedness.
- The realization that giftedness, in and of itself, does not ensure outstanding accomplishment.
- The comprehension of talent development as a dynamic process
- The identification of multiple domains in which giftedness can manifest.
- The domain-specific nature of talent

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[2] Dutch Committee on Tests and Testing (Commissie Testaangelegenheden Nederland). It is an independent body under the Netherlands Institute of Psychologists (NIP) that evaluates the quality of psychological tests used in the Netherlands.

While these models provide valuable insights, there is a growing recognition of the need for a more holistic approach to giftedness.[3] The prevailing emphasis on high intelligence and academic achievement, while undoubtedly significant, may potentially neglect crucial aspects of gifted individuals' experiences and needs. This emerging perspective necessitates a shift in perspective from viewing giftedness primarily through an educational lens to considering the gifted individual as a whole person. Such an approach would extend beyond the domain of academic performance to encompass the psychological, emotional, and social dimensions of giftedness. The emphasis is placed on the necessity of facilitating not only academic growth but also personal development and self-realization.

In this context, the challenge for educators and researchers is to develop more comprehensive models and support systems that address the multifaceted nature of giftedness. These should aim to empower gifted individuals to reach their full potential across various life domains, while also providing the necessary support for their unique challenges and experiences. This holistic perspective on giftedness represents a promising direction for future research and practice in the field of gifted education and psychology.

2.2   Educational needs and strategies – theoretical approaches

2.2.1 Learning styles and time management

2.2.1.1   Learning styles

Nauta and van der Ven's research (2012) offers an important examination of how gifted adults approach learning, using Vermunt's learning style model as a framework (1992). This approach is particularly insightful in light of the fact that prior studies on learning styles, such as those conducted by Kolb (1984) and Vermunt, largely focused on general populations without fully addressing the specific needs of individuals with high intelligence. The study by Nauta and van der Ven is noteworthy for its

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[3] While the focus is here on theories, the book (Bok-van der Voet, 2023) is very useful for solving issues that have arisen in the past – especially with regard to giftedness and trauma.
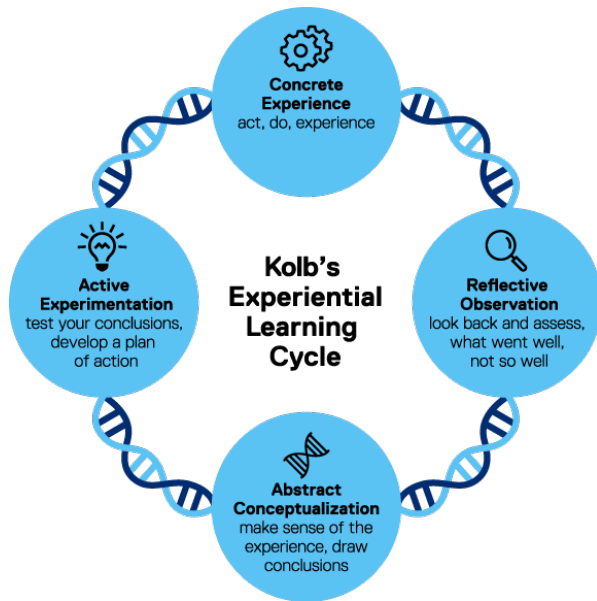
focus on gifted adults, thereby contributing to a more nuanced understanding of how this group learns (van de Ven & Nauta, 2012; van der Ven, & Nauta, 2012).

Figure 12 Kolb's Experiential Learning Cycle (The David Kolb Theory of How Experience Influences Learning, n.d.)

A significant finding of the study is the clear preference for meaning-directed learning among gifted individuals, with 75% of the participants exhibiting this preference. This finding is in stark contrast to that of Vermunt's original research, which observed a more balanced distribution of learning styles across general populations. This emphasis on meaning-directed learning, which is typified by an inclination towards profound comprehension as opposed to mere surface-level memorization, presents a challenge to the prevailing educational norms, which frequently rely on reproduction-directed strategies (van de Ven & Nauta, 2012). Gifted learners thus eschew pedagogical approaches that prioritize rote memorization, a point that adds a crucial dimension to the discourse on learning styles, particularly in the context of intelligent adults (Vermunt, 1992).

A comparison with Kolb's experiential learning model reveals a more significant divergence. Kolb's model presents the learning process as a cyclical one, comprising four stages: Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation (Kolb, 1984). While this approach places significant emphasis on the experience-reflection cycle, it fails to adequately address the intricate cognitive, emotional, and self-regulatory nuances inherent to gifted individuals' learning processes. In contrast to Kolb's framework, Nauta and van der Ven highlight the importance of considering advanced self-regulation, intrinsic motivation, and intellectual overexcitability in the context of gifted learners.

Moreover, Vermunt's learning style theory, which offers a more comprehensive view than Kolb's by integrating cognitive, motivational, and self-regulatory dimensions, also proves inadequate when applied to gifted learners. Vermunt categorizes learners into four types: meaning-directed, reproduction-directed, application-directed, and

undirected. However, as Nauta and van der Ven have noted, this model does not fully account for the sophisticated learning strategies employed by gifted adults. In particular, the critique emphasizes the necessity for Vermunt's model to be expanded to adequately address the highly self-regulated, metacognitive, and intrinsically motivated approaches that are characteristic of gifted learners. For example, Vermunt's meaning-directed learners exhibit similarities to Kolb's "assimilators," who favour abstract conceptualization and reflective observation, and to the application-directed learners who are akin to Kolb's "convergers" (Kolb, 1984; Vermunt, 1992). However, the fundamental distinction between these models and the study by Nauta and van der Ven is the explicit incorporation of self-regulation and metacognitive awareness. These characteristics are essential for comprehending the ways in which gifted adults regulate their learning, which extends beyond the general strategies delineated by Vermunt and Kolb. Vermunt's lack of emphasis on self-regulation, particularly for undirected learners, renders his model less applicable to high-functioning, self-directed learners, such as those in the gifted population.

Furthermore, the educational implications of Nauta and van der Ven's findings are significant. The study indicates that conventional educational approaches, which frequently prioritize reproduction-directed learning, are ill-suited for gifted individuals. Gifted adults demonstrate a clear preference for meaning-directed learning and a notable inclination toward application-directed learning once they have a profound understanding of a concept. This suggests that educational systems must provide more flexible curricula, allowing for both profound engagement with material and practical application, as well as mentorship and project-based learning that addresses the distinctive learning needs of gifted individuals. Ultimately, this critique of Vermunt and Kolb highlights the necessity for models that can more effectively engage gifted adults in lifelong learning. While both theories are foundational, they lack the requisite sophistication to fully capture the advanced cognitive and emotional dimensions of gifted learning. Nauta and van der Ven propose an adaptation of these models, suggesting that future educational strategies should prioritize metacognitive awareness and intrinsic motivation to better accommodate gifted learners.

In their analysis, Nauta and van der Ven challenge and extend earlier learning style models. By focusing on gifted adults, they highlight the limitations of Kolb's and Vermunt's theories in addressing the advanced cognitive, emotional, and self-regulatory needs of gifted learners. Their work contributes a crucial perspective to the

discourse on learning styles, emphasizing the necessity for more nuanced and flexible educational approaches to effectively support gifted individuals' learning needs in both academic and professional settings.

To integrate the discussion on Nauta and van der Ven's critique of Vermunt and Kolb's learning models with strategies for effective learning and time management, it is essential to highlight how these theoretical critiques inform practical approaches to gifted education. Nauta and van der Ven's emphasis on the distinctive learning requirements of gifted adults highlights the shortcomings of conventional models such as Kolb's experiential learning theory and Vermunt's learning style model, particularly in accounting for the advanced self-regulation, metacognition, and intrinsic motivation that are typical of gifted learners. This theoretical foundation provides a framework for understanding the necessity of tailored strategies, such as self-regulated learning, personalized time management techniques, motivation enhancement, and balancing individual and collaborative learning, for addressing gifted students' distinctive cognitive and emotional characteristics.

The critique of traditional learning models by Nauta and van der Ven underscores the necessity for flexible, meaning-directed approaches in the education of gifted learners. This emphasis informs the need for adaptable strategies in educational practice. By acknowledging the shortcomings of Kolb's and Vermunt's frameworks, particularly their inadequate focus on self-regulation and metacognitive abilities, educators can create more personalized learning environments that encourage autonomy and intrinsic motivation. This theoretical insight is crucial for understanding why strategies like time-blocking, fostering flow experiences, and promoting independent yet collaborative learning are particularly effective in meeting the needs of gifted learners. Therefore, the practical techniques outlined address the shortcomings identified in traditional learning models and align with the advanced cognitive processes and learning preferences highlighted in the critique.

Encouraging self-regulated learning among gifted individuals is imperative, as it cultivates autonomy and the capacity to adapt learning strategies to their distinctive requirements. This approach entails the establishment of realistic and attainable objectives, the formulation of individualized study techniques, and the implementation of reflective practices to facilitate the continual enhancement of learning methodologies (Zimmerman, 2002). The cultivation of these habits enables gifted learners to as-

sume control of their academic growth, thereby ensuring that their learning strategies evolve by their cognitive development.

2.2.1.2   Time management

Time management strategies for gifted learners must consider their distinctive cognitive profiles and learning preferences. It is essential to incorporate flexibility into schedules, as this allows learners to explore subjects of interest in-depth while still managing structured tasks. Techniques such as time-blocking can help achieve a balance between structured learning and exploratory activities. The Pomodoro Technique, for instance, can be adapted to match individual attention spans, ensuring that work intervals align with the learner's natural rhythms (Cirillo, 2009).

Another crucial element in supporting gifted learners is enhancing motivation. It is recommended that intrinsic motivation, which stems from personal interest and the pursuit of long-term goals, be prioritized over extrinsic rewards. By aligning learning tasks with the learner's passions and providing opportunities for flow experiences—in which the challenge is balanced with the learner's skills—educators can assist gifted students in maintaining engagement and motivation (Csikszentmihalyi, 2002; Csikszentmihalyi et al., 2018; Rheinberg & Engeser, 2018). Furthermore, affording learners autonomy in their decisions cultivates a sense of ownership over their educational journey while providing the necessary support to ensure that they do not feel overwhelmed by the freedom.

It is also essential to provide gifted learners with opportunities to engage in both collaborative and individual learning activities, as this can positively impact their social and emotional well-being. Although they may benefit from independent study to accommodate their often faster learning pace, peer study groups with like-minded individuals can provide valuable opportunities for collaboration. Participation in academic competitions or group projects that combine individual and collaborative components can further help balance these learning approaches, addressing intellectual and social needs (Rogers, 2007).

Thus, the most effective learning strategies and time management techniques for gifted individuals require a nuanced and personalized approach. Educators and students can devise bespoke strategies that address gifted learners' cognitive and emotional intricacies by grasping and implementing theoretical frameworks, such as learning

styles and self-regulated learning. The essential elements are flexibility, self-awareness, and the continuous adaptation of strategies to ensure that learners are both challenged and supported in their academic pursuits.

2.2.2 Self-Determination Theory, Flow and Autonomy

Motivation is of paramount importance in the context of education, particularly in the case of gifted students, who often require distinctive approaches to maintain engagement and foster their exceptional abilities. The relationship between intrinsic motivation, optimal learning experiences, and self-directed learning strategies is particularly relevant in the context of gifted education. This paper examines two pivotal concepts—Csikszentmihalyi's Flow Model and self-regulated learning—and their implications for motivating and assisting gifted learners.

2.2.2.1   Self-Determination Theory

Self-Determination Theory, developed by Ryan and Deci, provides a comprehensive framework for understanding motivation in educational contexts (Ryan & Deci, 2000). Self-Determination Theory (SDT) postulates that individuals possess three fundamental psychological needs: autonomy, competence, and relatedness. For gifted students, meeting these needs is particularly important due to their frequently advanced cognitive abilities and distinctive learning requirements. The three basic psychological needs are as follows:

- Autonomy—the need to feel in control of one's behaviours and goals. For gifted students, this often manifests as a desire for independent study and self-directed learning, essential for their intellectual growth and development.
- Competence—the need to gain competence in tasks and acquire new skills. Gifted students typically require more challenging tasks to experience growth and achievement.
- Relatedness—the necessity to experience a sense of belonging and attachment to others. This is of particular importance for gifted students, who may, at times, feel isolated due to their advanced abilities.

SDT identifies various motivational categories, from amotivation (a lack of motivation) to intrinsic motivation, with various forms of extrinsic motivation situated between these two poles. This continuum is illustrated in the SDT model, which demon-

strates the progression from non-self-determined to self-determined forms of motivation.
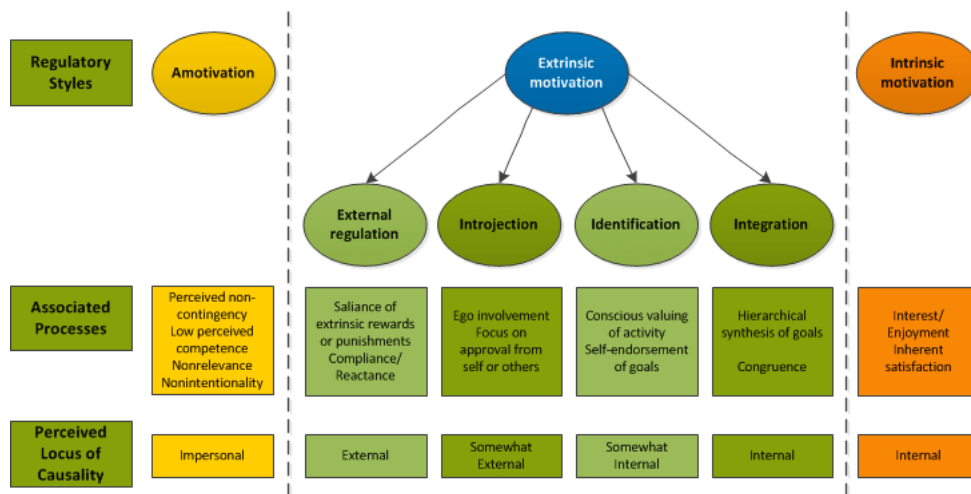
Figure 13 Ryan and Deci (2000: p. 61) A taxonomy of human motivation.

Figure 13 shows:

- Amotivation: Represents a lack of intention to act, often resulting from not valuing an activity, not feeling competent, or not expecting it to yield a desired outcome.

- Extrinsic motivation refers to the drive to engage in an activity or behaviour due to external factors, such as external rewards or external pressures. This encompasses four categories, ranging from the least to the most self-determined:

  - External Regulation: Behaviour motivated exclusively by external rewards or punishments.

  - Introjected regulation represents a state of self-pressure to act in a certain way, often driven by a desire to avoid feelings of guilt or anxiety, or to enhance one's ego and feelings of worth. These actions are performed to avoid feelings of guilt or anxiety, or to attain ego enhancements and feelings of worth.

  - Identified Regulation: The individual has identified with the personal importance of a behaviour and has thus accepted its regulation as their own.

  - Integrated Regulation: Regulations are fully assimilated to the self, meaning they have been evaluated and brought into congruence with one's other values and needs.

- External Regulation: Behaviour that is motivated exclusively by external rewards or punishments.
- Intrinsic Motivation: The inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn.

2.2.2.2   Application to Gifted Education

Applying SDT in gifted education involves several strategies: offering choices in learning experiences to support autonomy; providing optimally challenging tasks that align with Csikszentmihalyi's Flow concept; fostering social connections through collaborative projects and mentorship programs; nurturing intrinsic motivation by helping students find personal meaning in their studies; and facilitating the internalization of less engaging but necessary tasks. By implementing these principles, educators can create environments that nurture gifted students' natural growth tendencies, ultimately fostering more engaged and self-motivated learners better equipped to reach their full potential.

2.2.2.3   The Flow Model

Mihaly Csikszentmihalyi's Flow Model offers valuable insights into optimal learning experiences and intrinsic motivation. Flow is defined as a complete immersion in an activity, characterized by intense focus, control, and intrinsic reward from the task itself, often described as being "in the zone."
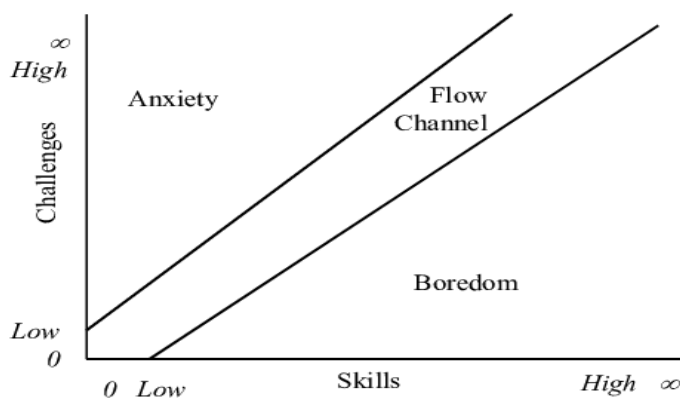
Figure 14 Csikzentmihalyi's Flow Model (Csikszentmihalyi, 2002).

The characteristics of Flow include intense concentration, the merging of action and awareness, loss of self-consciousness, a sense of control, distortion of time (where time seems to pass faster), and intrinsic reward from the activity. The Flow Model posits that flow occurs when there is a balance between the perceived challenges of a task and an individual's perceived skills. This equilibrium is of paramount importance. When the level of difficulty exceeds the individual's capacity,

anxiety is the result. Conversely, when abilities exceed the level of challenge, bore-dom ensues. For students with high levels of ability, achieving flow can be challenging due to their advanced abilities, which require tasks of significantly higher complexity than those typically given to their peers.

Application to Gifted Education: In the context of gifted education, the Flow Model highlights the significance of providing appropriately challenging tasks. Educators must continually adjust the difficulty level of assignments to align them with gifted learners' rapidly developing skills. This dynamic approach helps maintain engagement and facilitate deeper learning experiences.

When gifted students experience flow, they often demonstrate increased creativity, enhanced problem-solving abilities, and greater fulfillment in their learning. Nevertheless, facilitating flow states in an educational context presents several challenges. First, it is essential to identify the optimal challenge level for each student, ensuring that tasks are neither too easy nor too difficult. This necessitates ongoing assessment and modification to align with the student's evolving skill set. Furthermore, maintaining flow across diverse subjects and learning environments can prove challenging, as students may naturally achieve flow in one subject but encounter difficulties in others. Ultimately, educators must reconcile the promotion of flow experiences with other educational objectives, such as meeting curriculum standards or preparing students for standardized assessments. These objectives may not always align with the immersive and individualized nature of flow experiences.

2.2.2.4   Self-Regulated Learning and Autonomy

The term "self-regulated learning" (SRL) describes the process by which learners actively manage their own learning experiences. This process includes the setting of goals, the formulation of strategic plans, the monitoring of one's progress, and the evaluation of one's performance. For gifted students, who often possess advanced metacognitive abilities, self-regulated learning (SRL) can be an effective strategy for optimizing their potential.

Gifted learners often flourish when afforded greater autonomy in their educational pursuits. Self-regulated learning provides a structured methodology that enables these students to assume control of their educational pursuits. It allows them to pursue areas of profound interest, exploring subjects that pique their curiosity. Such autonomy also

permits gifted students to work at their own pace, frequently progressing beyond grade-level expectations, which helps them to remain engaged and motivated. Furthermore, self-regulated learning facilitates the growth of critical thinking and problem-solving abilities, as students are guided to establish objectives, devise strategic plans, and assess their progress. With the passage of time, this approach fosters independence and cultivates lifelong learning habits, thereby equipping gifted students with the tools to continue growing intellectually throughout their lives.

Educators can employ various strategies to promote self-regulated learning among gifted students. One efficacious approach is the instruction of goal-setting techniques, which assists students in defining transparent and attainable objectives for their learning and motivates them to remain on course. It is similarly vital to encourage reflective practices, as this enables students to think critically about their progress and modify their strategies through this reflection. Providing opportunities for self-assessment allows gifted learners to evaluate their work and identify areas for improvement. Providing students with various learning activities and projects allows them to engage with material that aligns with their interests and abilities, further supporting their autonomy. In addition, educators can model and explicitly teach self-regulation strategies, demonstrating how to plan, monitor, and adjust learning approaches for continued success.

2.2.2.5   Integrating Flow and SRL in Gifted Education

The flow experience can motivate students to engage in self-regulated learning practices, while SRL skills can help students create conditions conducive to achieving flow states.

Integrating these concepts into gifted education may entail a variety of approaches. One essential strategy is the design of flexible curricula that permit students to modify the level of challenge according to their abilities, thereby ensuring that tasks are neither excessively easy nor excessively difficult. An alternative approach is the implementation of project-based learning, which enables students to explore their interests in-depth, fostering engagement and creativity. Furthermore, technology can facilitate personalized learning experiences, adapting to individual needs and enabling more precise instruction. Furthermore, establishing learning environments that facili-

tate independent study and collaborative work encourages students to develop auton-
omy while benefiting from peer interactions and teamwork.

Educators and parents are pivotal in enabling gifted students to engage in flow expe-
riences and cultivate self-regulated learning. It is the responsibility of the teacher to
act as a facilitator, guiding students toward appropriate challenges and providing sup-
port for their efforts in autonomous learning. This entails assisting students in identi-
fying tasks that align with their skill levels and providing the encouragement and re-
sources necessary for independent exploration. Concurrently, parents can reinforce
these concepts at home by cultivating curiosity, supporting self-directed projects, and
emphasizing the learning process over mere outcome celebration. Parents can facili-
tate the development of self-regulated learners by fostering a love of learning and
providing opportunities for self-guided inquiry.

Integrating Csikszentmihalyi's Flow Model and SRL-practices represents a promising
approach to motivating and supporting gifted students. By creating environments that
foster flow experiences and equipping students with self-regulation strategies, educa-
tors can assist gifted learners in maximizing their potential and developing lifelong
learning skills.

2.3   Current state of affairs

In (Dutch) higher education – or what is known in the Netherlands as Middelbaar
Beroepsonderwijs, Hoger Beroepsonderwijs, and Wetenschappelijk Onderwijs – the
topic of high giftedness/ high ability seemed long neglected but is gradually receiving
more and more attention. In this section I predominantly focus on what has been pub-
lished in the past decade.

Much has been written about procrastination, perfectionism, self-esteem and self-
efficacy, *but* none of these articles focus on gifted students as their target audience
(Jadidi et al., 2011; Joseph, n.d.; Mongrain & Blackburn, 2005; Nilufer, 2017;
Saad, 2015; Sims, 2014). Issues concerning the mental health of students are raised
in recent articles too (Snyder et al., 2021; Suldo et al., 2018) but what the status of
the mental health of gifted students in Western-Europe/ the Netherlands is, falls out-
side the scope of their research.

In 2015 the Stichting Koepel Hoogbegaafdheid (the umbrella organisation/Foundation for Gifted) published Slim 2.0 facetten van hoogbegaafdheid (Stichting Koepel Hoogbegaafdheid, 2015). While it does indeed present various facets of giftedness, it is striking that only two of the 27 chapters focus on (young) adults who are not positioned as parents of a gifted child, namely within the chapter on the perception of religion (Dijkstra, 2015) and the (one-page!) chapter on higher education (Welling, 2015).

In 2018, Marjolijn Rijnberg wrote her ECHA-thesis on the topic of students in Higher Education (University of Applied Sciences) (Rijnberg, 2018). Rijnberg's dissertation, 'Een wereld te winnen: Hoogbegaafden in het HBO laten leren', is a major contribution to the field. This research examines the challenges faced by gifted students in higher education (HBO) and proposes strategies to reduce their risk of academic delay or dropping out. This thesis shifts the focus to universities of applied sciences and addresses a critical gap in the literature. It builds on previous research that has identified the unique cognitive, affective, and metacognitive learning behaviours of gifted individuals and extends these findings to the HBO setting. The research draws on established theories of giftedness and learning and integrates them with contemporary educational practice. It acknowledges the work of pioneers in gifted education, while applying their insights to the specific context of higher vocational education. This approach represents a significant development in the field, bridging the gap between theoretical understanding of giftedness and practical application in higher education settings.

A key contribution of this study is its emphasis on the multifaceted nature of giftedness in higher education. It goes beyond traditional academic measures to consider emotional and motivational factors as crucial elements in the success of gifted students. This holistic approach aligns with recent educational psychology trends that recognize the interplay between cognitive abilities and affective factors in learning outcomes.

The thesis also builds on research in educational design, particularly in its advocacy of problem-based learning (PBL) and honours programs. It synthesises findings from studies on the effectiveness of PBL with research on gifted education and proposes an innovative approach to curriculum design for gifted students in HBO institutions. This integration of pedagogical methods represents a significant step forward in tai-

loring higher education to the needs of gifted learners. The research draws on literature from gifted education and teacher training to address the role of educators. It highlights the need for specialized training for teachers and counsellors working with gifted students, building on previous studies that have highlighted the importance of educator preparation in supporting the diverse needs of learners.

The research also contributes to the ongoing dialogue about mindset and its impact on academic achievement. Incorporating research on growth mindset into strategies for supporting gifted students offers a fresh perspective on addressing challenges such as perfectionism and underachievement in this population. Rijnberg's research represents a significant advance in gifted education research in higher education. In doing so, it fills a gap in the existing literature and paves the way for future research and practical applications in supporting gifted students throughout their higher education journey.

In September 2019, the Foundation HB-HO (*Hoogbegaafd-Hoger onderwijs*, n.d.) was established to facilitate communication about giftedness among higher education professionals. At the HB-HO annual conference, Marjorein van Houten (2024) introduced her recently published work, "Brains & Beyond: Gids hoogbegaafdheid in het hoger onderwijs" (Guide for high giftedness in higher education). This accessible publication features interviews and checklists with practical advice for gifted students. The primary objectives of the guide are to empower gifted students to discuss their experiences openly and to highlight the expertise of NHL Stenden staff members knowledgeable about giftedness. By providing these resources, the publication aims to bridge the gap between gifted students and the support available to them in higher education settings.

Accessible material for gifted students, their parents, educators and student advisors can be found in the leaflet section of the IHBV ('IHBV | Instituut Hoogbegaafdheid Volwassenen | Leaflets', n.d.).

3 Empirical Research

3.1 Methodological approach

This research employs an exploratory methodological approach to investigate the experiences and needs of gifted students, doctoral candidates, and postdoctoral researchers in higher education. The study combines an extensive literature review with empirical research to comprehensively understand how gifted individuals navigate academic environments and their challenges.

This research is anchored in a comprehensive review of existing literature, which serves two primary purposes. First, it examines existing research on students in higher education to identify pertinent issues that could be further explored through surveys. This preliminary examination of the literature enables the delineation of the study's boundaries and identifying areas where insights into high giftedness may illuminate challenges and opportunities within academic settings. Secondly, the literature review concentrates on learning strategies and standard educational practices, specifically assessment methods and student supervision. This aspect of the study seeks to evaluate the efficacy of conventional approaches commonly employed in higher education for gifted students, including those at the doctoral and postdoctoral levels.

Based on the literature review's findings, the empirical component of the study comprises two online surveys: one targeting students in higher education and another aimed at PhD candidates and postdoctoral researchers. The surveys were designed to elicit participants' insights on various educational experiences, including motivation, support, and time management challenges. The exploratory nature of the surveys permitted the gathering of a broad range of data, which was then analyzed to identify common themes and experiences among gifted individuals.

The survey was distributed using a variety of platforms to ensure a diverse range of participants. The recruitment channels included fellow ECHA (European Council for High Ability) participants, professional networks on LinkedIn, and social media platforms like Facebook, particularly groups dedicated to discussions on giftedness. The multi-platform approach facilitated the expansion of the survey reach and the acquisition of a diverse range of perspectives. The participants were required to self-identify

as gifted, thus ensuring that the responses were pertinent to the study's focus on high giftedness in higher education.

To ensure ethical standards were maintained and participant privacy was protected, all survey responses were anonymized. The data set was subsequently de-identified by removing personal information, including email addresses, provided to receive updates. Dutch responses were translated into English for incorporation into the thesis to enable inclusivity. Where applicable, quantifiable responses (such as yes/no answers) were standardized and presented in graphical or tabular formats to enhance clarity and facilitate analysis. The analysis of the survey results was conducted to identify the key themes and patterns that emerge from the experiences of gifted individuals in higher education. This process entailed a meticulous examination of quantitative and qualitative data, to gain a more profound comprehension of the particular needs, challenges, and prospects confronting gifted students, PhD candidates, and postdoctoral researchers.

This study aims to provide a comprehensive picture of giftedness in higher education by integrating the insights gained from the literature review with the empirical data collected through the surveys. The combination of theoretical foundations and real-world experiences forms the basis for the practical recommendations offered in the thesis. These recommendations guide educators, institutions, and policymakers in developing more effective support systems and learning environments for gifted individuals in advanced academic settings. Through this methodological approach, the thesis seeks to bridge the gap between existing knowledge and the experiences of gifted individuals in higher education, ultimately contributing to improving educational practices and support structures for this unique group of learners.

3.2   Development and structure of the survey

To conduct an empirical analysis, students and postdoctoral researchers/postdoctoral fellows who self-identify as gifted were invited to complete an online questionnaire. An online questionnaire was constructed to examine the experiences of giftedness among students in higher education, as well as among those pursuing doctoral degrees and postdoctoral research positions, and the extent to which they are being supported. The survey was conducted anonymously and included students, Ph.D.-

candidates, and postdocs of different age groups. While the results are exploratory, they may indicate areas for further research. The results do, however, provide insight into how those who completed the survey currently perceive the support available to gifted students in higher education, as well as the supervision of Ph.D.-candidates and postdocs. For the two surveys, see Annexes.

3.3 Survey results

PhD students and postdoctoral researchers (n=20) reflected on the various challenges they encountered during their Bachelor's and Master's studies. Many students experienced difficulties in maintaining a healthy balance between academic work and personal well-being. They frequently overcommitted to additional courses, honours programs[4], and extracurricular activities, resulting in burnout and exhaustion. Others encountered difficulties maintaining motivation, particularly for tasks they perceived as routine or uninteresting, such as writing papers or studying for examinations. These tasks were often seen as obstacles to pursuing more rewarding work, such as research. Additionally, managing personal and external expectations proved challenging, as many felt pressure to live up to their reputation as "intelligent," which led to reluctance in seeking help or feedback. Standardized assessments, such as multiple-choice examinations, were frustrating for those who preferred open-ended, creative problem-solving. Furthermore, negotiating the intricacies of academic culture could prove to be a daunting task, mainly when there is a discrepancy between one's learning style and the conventional teaching methodologies. For some, the inflexible structure of tasks such as thesis writing or technical subjects further compounded these difficulties as they sought a more adaptable learning process. It will be interesting to see if these perspectives are reflected in the higher education survey.

3.3.1 Understanding giftedness in Higher Education and beyond

The majority of participants in the survey of higher education students (n=60) identified as female, representing 58.3% of the total responses (n=35). The remaining

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[4] Some respondents remarked that due to requirement to have 'high marks' they could not participate.

41.7% of respondents (n=25) identified as male. In the survey for doctoral candidates and postdoctoral researchers, 85% were female (n=17), while only three males participated (15%).

The survey on giftedness in higher education, completed by students, indicates that most respondents are 27 or older, representing 56.7% of the total participants (n=34). The next largest group of participants comprises individuals aged 24-26, representing 15% (n=9) of the total sample. The 21-23 age group constitutes 13.3% (n=8) of the respondents, while the 18-20 age group represents 10% (n=6). The smallest age group comprises individuals aged 15-17, representing 5% (n=3) of the total sample. This distribution demonstrates that most survey participants are adults, with a notable proportion exceeding 27 years of age. The survey on giftedness in higher education, which focused on PhD students and postdoctoral researchers, revealed that the largest group of respondents fell within the 30-39 age range, comprising 40% of the participants (n=8). The 20-29 age group constitutes 30% (n=6) of the total sample, while 25% of respondents are aged 40-49 (n=5). A small proportion of participants (5%, n=1) elected to refrain from disclosing their age. This distribution indicates that most survey respondents are in their 30s, with a significant number in their 20s and 40s.

The survey on giftedness in higher education indicates that there are differences in the identification of IQ tests between male and female respondents. Among the male participants, a notable number (n=13) stated that they had not been identified as gifted through an IQ test, whereas a smaller group (n=7) reported that they had been. Furthermore, five males indicated that a professional had identified them as gifted without formal testing.

In contrast, the largest group of female respondents (n=16) indicated that they had been identified as gifted through an IQ test. At the same time, a smaller number (n=10) reported that they had not undergone such identification. Moreover, nine female respondents indicated that a professional had proposed that they exhibited gifted characteristics based on consultation or family background. Overall, more female respondents in the survey reported official identification as gifted than males. However, this discrepancy is likely attributable to the higher number of female participants in the survey rather than an actual prevalence in the population. Among those engaged in doctoral or postdoctoral studies, 65% of the participants have undergone an intelligence quotient (IQ) assessment or a Mensa-type examination. Additionally,

the IQ score was requested, and of those who completed an IQ test, 10% scored between 144 and 159 TIQ, while the remaining 55% scored between 130 and 144 TIQ.

3.3.1.1   Study-choice

Study choices at different higher education levels reflect motivations such as personal interest, career goals, and external factors. For HBO, teaching (PABO) was driven by a desire to help children [16, 26][5], social work by a desire to help people [16], and nursing by job requirements [9]. In creative and technical fields, fashion (AMFI) was chosen for its broad scope [12] and electrical engineering for its challenge and potential in sustainable technology [36].

At the university level, humanities and languages such as Korean language and culture [7], philosophy [34, 51], and liberal arts [10] were chosen for intellectual curiosity or orientation. At the same time, religious studies appealed for its accessibility after HBO [33]. In the social sciences, psychology attracted students interested in human behaviour and personal growth [25, 29, 35, 39, 47], while criminology [45] and education [11, 23] were chosen for their practical focus and research.

In business and economics, real estate [1], economics [37], and finance [48] were selected for their career potential and interest in numbers. In Medical and Life Sciences, Biomedical Engineering [5], Pharmaceutical Sciences [31], and Medicine [56] were driven by interest in health, robotics, and the medical field.

STEM fields such as Aerospace Engineering [43], Sustainable Energy Technology [54, 58], and Artificial Intelligence [38] were chosen for their focus on technology and addressing climate change. Interdisciplinary programs such as Creative Technology [14, 57] and Public Administration [57] were selected for their mix of creativity and problem-solving.

Personal interests, career prospects, and the desire to make a difference were key motivators. Flexibility, such as part-time options and opportunities for career change or advancement, also played an important role in the decision. A similar distribution of disciplines is seen within the PhD/Postdoc survey, but no information about the motivation for their studies was asked.

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[5] If numbers are between [] this means they are references to statements made by students from Higher Education, as can be found in 10.5281/zenodo.13925852.

3.3.1.2　Defining Giftedness by respondents

The responses to the survey indicate that giftedness is perceived as a distinctive mode of cognition and experience of the world. This is characterized by accelerated cognitive processing, sensitivity, and a proclivity to approach problems and situations in a manner that diverges from the norms of the general population. Respondents indicated that their giftedness is characterized by the capacity to think rapidly, discern connections that may not be apparent to others, and devise innovative solutions to problems. For some, this manifests as intense focus and a strong drive for learning, while for others, their ability to process information swiftly can result in overthinking or mental exhaustion.

Respondents recognise that they, as gifted individuals are also highly emotionally and socially sensitive, often perceiving subtle nuances in their surroundings. This heightened awareness can result in feelings of isolation or misunderstanding, as they frequently perceive and react to situations differently from their peers: they manifest a profound capacity for empathy and a profound commitment to principles of fairness and justice.

A common thread throughout the responses is the challenge of navigating the structure of traditional education. Gifted individuals often perceive that their learning needs are inadequate within a conventional educational system, which they often perceive as too slow or limiting. It is not unexpected that respondents prefer a top-down approach to learning, whereby they would first grasp the broader concepts before delving into the specifics. Such an approach frequently results in frustration in educational settings that adhere to a linear or overly simplified curriculum. Furthermore, respondents indicate that their cognitive processes are more abstract and intricate, rendering them challenging to integrate into conventional educational frameworks and straightforwardly communicate their ideas.

An emotional intensity associated with giftedness is also flagged. This intensity is not exclusive to learning and problem-solving; it also manifests in how these individuals experience the world, which can be more vivid and overwhelming. The experience of music, emotions, and life experiences is more profound, which can contribute to both personal fulfillment and challenges, such as anxiety or difficulty managing emotions. Additionally, respondents indicate that giftedness frequently coincides with a pro-

nounced aspiration for perfection, which can engender internal pressure to excel perpetually.

Lastly, giftedness is sometimes perceived as both a blessing and a challenge. Although it facilitates rapid comprehension, ingenious problem-solving, and an insatiable appetite for knowledge, it can also result in social isolation, stress, and a sense of not belonging. Some have recently begun to understand what it means for them to be gifted and are now figuring out how to navigate its complexities best.

3.3.1.3   Twice-exceptional

The responses from the Dutch participants regarding twice-giftedness indicate a variety of conditions similar to those observed in the overall dataset. Respondents from the Netherlands identified the following key conditions:

-   Attention deficit hyperactivity disorder (ADHD) was also a frequently mentioned condition. This is an often occurring condition, with participants using both the terms "ADHD" and "ADD" to describe their diagnosis.

-   Dyslexia: Some respondents from the Netherlands indicated that they had been diagnosed with dyslexia, either formally or based on a family history that gave rise to suspicion of the condition.

-   Autism: Autism is mentioned in conjunction with other conditions, such as ADHD or dyslexia, underscoring the intricacies of twice-giftedness.

-   Dyscalculia: A small number of respondents indicated that they experience dyscalculia, a less well-known learning difficulty related to mathematics. Some Dutch respondents expressed uncertainty or doubt about their diagnoses, while others referred to professional testing results.

This filtered analysis focuses solely on the responses from Dutch participants and reflects a broad spectrum of twice-giftedness challenges.

Table 1 Reporting to be twice-exceptional (H.E.-survey).

	Giftedness	Twice-exceptional (*3 identified multiple)				
		ADHD	ADD	Dyslexia	Autism	Dyscalculia
Male	5	1	2	1	1	0
Female	30	5	4	0	3	1
Total	35	6	6	1	4	1

Within the survey of Ph.D.-candidates/Postdocs, 15% (n=3) were identified as twice-gifted, but no specification was asked.

3.3.1.4   Perceived presence of overexiteabilities

Table 2 Dąbrowski's overexciteabilities per schooltype- based on H.E.-survey (participants own estimations).

	MBO	HBO	WO
psychomotor	0	5	18
sensual	0	0	0
emotional	2	13	50
imaginational	2	16	58
intellectual	0	20	58

The data in Table 2 tells the following. The largest number of respondents were from the WO category (university-level education); among them, intellectual and imaginational overexcitabilities were frequently mentioned. This suggests that many university students identify with creativity, abstract thinking, and a deep desire for knowledge and analysis. The most commonly reported trait is intellectual overexcitability, which indicates a strong inclination toward critical thinking and problem-solving. This aligns with the academic nature of university study.

The distribution of respondents in the HBO category (applied sciences) is relatively balanced across the three overexcitabilities: emotional, imaginative, and intellectual. This indicates that students in applied sciences acknowledge a combination of traits, although intellectual and imaginative traits remain particularly prominent. Emotional overexcitability is well-represented in HBO, suggesting a correlation with emotional sensitivity or empathy, curiosity, and creative thinking.

The data set for MBO is limited. A single respondent represents MBO (vocational education). Given the lack of data, meaningful conclusions about MBO students are impossible. The single respondent indicated both psychomotor and emotional overexcitability, which precludes generalizations about the population receiving vocational education.

No respondent mentioned sensual overexcitability, irrespective of the educational establishment they attended. This absence may indicate a lack of recognition or identification of this trait among the respondents or reflect its rarity within the sample.

3.3.1.5　Expressing giftedness within or outside of education

Where does your giftedness mostly manifest?	Frequency
Within Education	21
Outside the educational environment(e.g. hobbies, volunteer work, politics, etc.)	39

The table shows that a more significant portion of respondents (39) feel their giftedness manifests more outside of the educational environment, such as in hobbies, volunteer work, or politics. In contrast, 21 respondents experience their giftedness primarily within an educational setting. This suggests that many gifted individuals find their abilities more applicable or visible in non-academic contexts.

3.3.1.6　Talking about giftedness

The survey responses indicate that motivations vary considerably for disclosing or concealing one's giftedness to an educational institution. These motivations are often shaped by personal experiences, perceptions of how others might respond, and the practical implications of sharing this information.

Reasons for Disclosing Information: Thirteen respondents (21,7%) indicated that they had chosen to share their giftedness with their educational institution to address practical needs and challenges they were experiencing in their studies. Some respondents stated that they were experiencing difficulties with the pace of their courses, finding them either too slow or lacking sufficient depth, which prompted them to initiate discussions with their mentors or study advisors [14, 24, 26]. Others believed that discussing their giftedness was an effective method of proactively addressing potential challenges they had previously encountered, such as difficulties with assignments or examinations. This approach allowed them to identify and address these issues early [15, 24, 59]. Some respondents disclosed their giftedness in more specific contexts, such as when discussing research topics or during study-related conversations [20, 30]. Furthermore, some respondents indicated a need to disclose their giftedness to ensure they could effectively manage multiple responsibilities or to seek flexibility in their attendance and coursework requirements [30]. At least two persons indicated to meet with total incomprehension from study advisors and teachers [32, 33].

Most respondents (78.3%) indicated they had chosen *not to disclose* their giftedness, citing various reasons. For many respondents, the decision not to disclose their giftedness was based on the perception that it was unnecessary or irrelevant, mainly if they felt capable of managing their studies independently without additional support. Others expressed concern that disclosing their giftedness might elicit adverse reactions, such as being labelled as arrogant or facing unrealistic expectations from peers or educators [12, 15, 50, 57]. Additionally, some respondents indicated that they did not anticipate their institution would provide meaningful accommodations or support in response to their disclosure, which further contributed to their decision to keep it to themselves [5, 17, 31, 47]. A few respondents indicated that they had not disclosed their giftedness because they were unaware of it or had reservations about whether they met the criteria for being classified as "gifted."

The respondents indicated that they were reluctant to disclose their giftedness due to previous experiences of prejudice, misunderstanding, or ridicule. Such individuals expressed concern that others might view their disclosure as mere bragging or that they would be subjected to unfair assumptions about their abilities. Some respondents had previously encountered situations where their giftedness was used against them, with others assuming they were underperforming due to laziness or expecting them to handle more than they were comfortable with [40].

Some respondents indicated a preference for pursuing their educational journey independently, without relying on the label of giftedness. These respondents expressed a desire to see how far they could progress independently or indicated that they were content with minimal involvement from educational support. Others did not perceive the necessity of disclosing their giftedness if they had already developed effective study methods or did not believe they required any additional assistance [10, 44, 53].

A complex interplay of personal and practical factors influences the decision to disclose giftedness. While some students perceive the need to communicate their giftedness to address challenges or seek flexibility, others are concerned about the potential stigma, lack of support, or fear of being misunderstood. Ultimately, the choice to tell or not tell is shaped by individual experiences, the perceived value of disclosure, and the possible reactions from the educational environment.

It is noteworthy that 90% (n=18) of Ph.D.-candidates/Postdocs do not discuss their (potential) high ability with their supervisor, whereas only 10% (n=2) have done so. This finding may be attributed to a lack of comprehension regarding the multifaceted

manifestations of giftedness and/or the implicit bias that one can achieve significantly with minimal effort or explanation.

3.3.2   Learning Strategies

Seventeen respondents indicated that they had received training to enhance their learning abilities. Such programs included mindfulness training and coaching sessions during secondary school, fear of failure training, and guidance from psychologists after facing challenges such as burnout. Additionally, some respondents indicated that they had participated in specialized programs, such as "leren leren" classes during their academic years, or received specific training in planning, mind mapping, and other techniques designed to enhance executive functions. A few respondents reflected on how these experiences helped them realize that traditional learning methods were ineffective for them, leading them to adopt alternative approaches, such as top-down learning or faster-paced methods that were better suited to their needs.

Other respondents acquired their knowledge through informal means or various experiences, including participation in after-school study programs, coaching from different perspectives, and experimentation with learning techniques derived from online resources or adopted by teachers and family members. One individual indicated that they had participated in a course on neuro-linguistic programming. At the same time, another described learning through trial and error, observation of others, and reading scientific journals to refine their learning strategies. Some respondents expressed that the traditional "learning strategies" methods taught in school did not adequately address their specific needs, such as maintaining focus and motivation or executing their plans.

3.3.2.1   Motivation

The following boxplot shows that most respondents rated belief in their own abilities as highly important for motivation, with a narrow interquartile range, meaning responses were closely clustered around the higher importance levels.

Importance of belief in self-efficacy for motivation
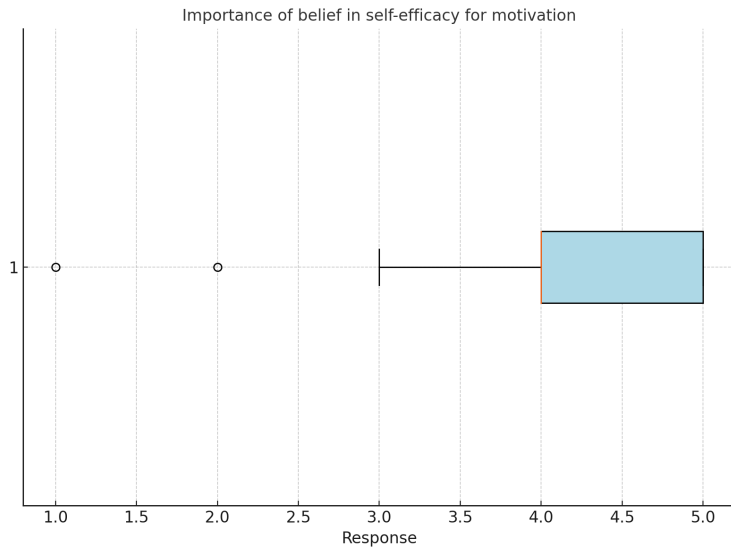
Figure 15 Importance Of Belief In Self-Efficacy For Motivation (Survey H.E.)

Importance of task value (understanding the bigger picture) for motivation
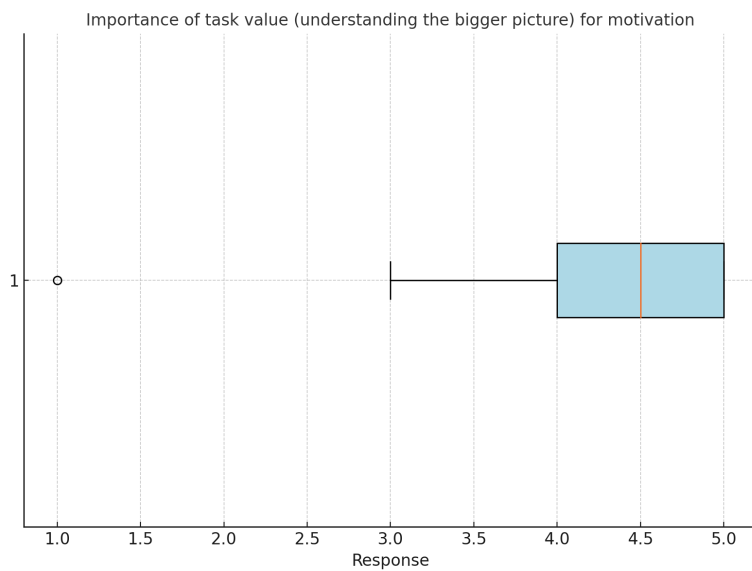
Figure 16 Understanding The Bigger Picture for your motivation (H.E.survey).

This boxplot indicates that understanding the value and purpose of tasks is also seen as important, with responses slightly more spread out than self-efficacy, but still concentrated in the upper importance range.

Importance of experiencing sufficient support from surroundings for motivation
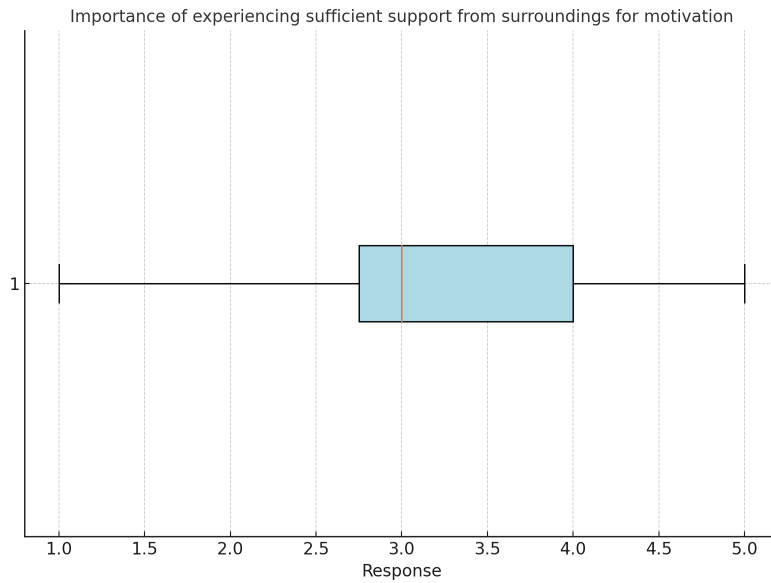
Figure 17 Importance of experiencing sufficient support from surroundings for motivation (H.E. survey).

This boxplot indicates that understanding tasks' value and purpose is also important. Responses are slightly more spread out than self-efficacy but still concentrated in the upper importance range.

3.3.2.2   Study Structure Overview

The responses indicate that students exhibit disparate levels of comprehension about their understanding of the broader structure of their academic programs and the relationship between individual courses and the larger educational framework. A significant number of respondents indicated that they generally understand the expectations placed upon them, with the provision of course guides, syllabi, and grading rubrics frequently assisting them in navigating the curriculum. Some students proactively seek additional information when necessary, such as consulting with their instructors or utilizing external resources. Proactive steps to clarify expectations tend to engender a greater sense of confidence.
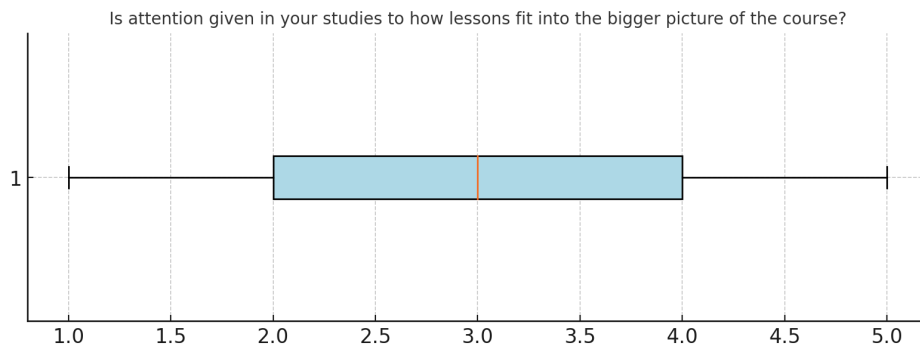
Figure 18 Is attention given how lessons fit into the bigger picture of the studies? (H.E. survey)

Nevertheless, most students reported difficulties comprehending the alignment between their courses and the overarching program. Such challenges are more pronounced in the context of abstract courses or in instances where expectations are not explicitly delineated. Some students indicated that they experience difficulty in connecting the course material to the broader context, which can lead to confusion about the most important aspects to focus on. In some cases, students may overestimate the extent of the required work, which can result in unnecessary stress and frustration. The lack of face-to-face interaction in online learning environments makes it challenging to grasp the broader context. Some respondents indicated that their inquiries were not always well-received by instructors. In particular, some felt that their requests for more detailed guidance were dismissed or perceived as indications of incompetence, which can discourage them from seeking further assistance.

3.3.2.3 Focus and concentration

The data on focus and concentration reveals several patterns regarding the conditions that either facilitate or hinder the ability to concentrate. A significant finding is the pivotal role of intrinsic motivation. The respondents consistently indicated that tasks aligned with their interests or goals significantly enhanced focus, mainly when the material was novel or cognitively challenging, stimulating curiosity and engagement. In contrast, tasks perceived as routine or mundane were found to have a demotivating effect, resulting in a rapid loss of focus. This underscores the importance of task novelty and relevance for sustained attention.

The presence of structure, such as deadlines or clearly defined tasks, was also identified as a critical factor. Many participants observed enhanced concentration under conditions of time pressure or when tasks were clearly defined with specific goals.

Deadlines were often identified as a trigger for heightened concentration or "hyperfocus." The combination of intrinsic motivation and external structure was essential for maintaining focus, with clear goals providing a roadmap for efficient task completion. Conversely, many internal and external distractions were identified as impediments to concentration. Internal factors included a lack of interest or relevance, whereby tasks were perceived as irrelevant, overly simplistic, or disconnected from personal goals, which resulted in disengagement. External distractions, such as noise and clutter, were also identified as factors that disrupt focus, particularly for individuals with sensory sensitivities, such as ADHD. The participants underscored the importance of a tranquil and well-ordered setting for sustaining concentration. They frequently employed tools such as noise-cancelling headphones to mitigate distractions.

Furthermore, emotional states and cognitive load were identified as additional factors influencing focus. Stress, fatigue, and anxiety were frequently cited as obstacles to maintaining focus. Individuals with multiple responsibilities, such as work and family, encountered challenges maintaining focus amidst competing demands. Fatigue was identified as a significant issue, with many respondents indicating that it severely impaired their ability to concentrate for extended periods. This highlights the necessity of maintaining a balanced emotional and physical state to facilitate effective concentration.

Task difficulty was also identified as a significant factor. Respondents indicated that they experienced boredom and distraction when tasks were too simple. Conversely, when tasks were overly complex, respondents reported feelings of anxiety and avoidance. The respondents indicated that tasks needed to be challenging enough to stimulate engagement without overwhelming individuals.

In conclusion, focus is influenced by a combination of intrinsic motivation, external structure, and environmental conditions. Meaningful, novel or challenging tasks foster engagement, especially when paired with a clear purpose. Conversely, irrelevant or overly complex tasks, distractions, and emotional distress are significant barriers to focus. Enhancing focus involves aligning tasks with personal goals, creating optimal environments, and managing cognitive and emotional well-being.

3.3.2.4   Time management

Table 4 Time management inventory.

Statement	Frequency
I need time pressure to get something done.	39
I want to do more than what I have time for.	21
I lose a lot of time because I struggle to distinguish between main and side issues ('everything is interesting anyway').	18
If it 'has to', then I no longer feel like it (I want to be able to decide for my-self).	28
I struggle with 'starting'/'getting started'.	28
I experience 'burnout' (doing too much/ overloaded) and 'boredom (too boring/under-stimulated).	37
I have no need/desire to work hard; it's not for me.	5
When I'm busy, I have trouble stopping (I keep researching and writing even more).	25
I am very optimistic that I will finish something, but I run out of time.	5
I never learned proper time management.	14
Other: my challenge is scheduling	6

The survey responses implicitly yielded three primary categories of motivation: intrinsic, extrinsic, and mixed. These categories were determined based on participants' reasons for engaging in their studies.

Intrinsic Motivation: Survey respondents who described being intrinsically motivated indicated that personal interest, curiosity, and enjoyment were the primary motivating factors. Such individuals engage in tasks because they find them inherently satisfying or stimulating. For these individuals, the act of studying is often undertaken for the sake of personal fulfillment, self-growth, or the joy of learning new things. Many respondents indicated that their motivation naturally increases when encountering an interesting or meaningful subject. However, some respondents stated frustration that their educational pursuits do not always align with their intrinsic interests, necessitating active pursuit of courses or projects that resonate with them.

Extrinsic Motivation: Some respondents indicated that extrinsic motivation plays a significant role in their educational pursuits. External objectives, such as attaining a diploma, pursuing enhanced job prospects, or fulfilling specific work requirements, drive this type of motivation. Many respondents indicated that they are motivated to pass examinations, complete assignments on time, or fulfill obligations to avoid fi-

nancial stress, such as avoiding student loan debt. In such instances, the emphasis is placed on attaining outcomes rather than on the individual's personal interest in the subject matter. In these cases, external pressures often serve as the driving force behind their progress.

Mixed Motivation: A substantial proportion of survey participants indicated that they experience a combination of intrinsic and extrinsic motivation. While initial motivation may be derived from a genuine interest in the subject matter, external goals, such as pursuing a degree or attaining high grades, sustain motivation over time. Some respondents indicated that while they may initially be driven by personal satisfaction and intellectual curiosity, extrinsic factors such as deadlines or career prospects become more prominent as tasks become less engaging. This combination of personal interest and external rewards gives rise to a more intricate motivational dynamic whereby students must reconcile their desire for enjoyment with the practical necessities of their situation.

3.3.2.5   Strategies Time Management

Time management is a critical skill for academic success and personal productivity. This chapter explores various strategies individuals have developed to address time management challenges based on a qualitative survey of respondents. The diverse approaches highlighted the personal nature of effective time management while revealing common themes and techniques.

Planning and scheduling emerged as fundamental strategies for many respondents. Techniques ranged from creating weekly plans and schedules [2, 3, 41] to using paper agendas with colour coding and time blocks [42, 53]. Some individuals successfully assigned specific time blocks to tasks [31, 37], while others preferred to plan 1-2 weeks and review progress weekly [54]. In particular, some emphasized flexibility in planning, with one respondent stating, "I no longer plan very strictly, but I write down what I need to do each week. This way I can choose when to do what and when I have the energy (and desire) to do it" [40]. This approach illustrates the importance of adapting planning strategies to individual work styles and energy levels.

Closely related to planning is prioritizing tasks, often implemented through to-do lists. Many respondents reported making lists and checking off completed tasks [16, 23, 26], with some emphasizing the importance of prioritizing tasks within these lists

[27]. Visual reminders, such as post-it notes for urgent tasks [58], were also mentioned as effective tools. One respondent described a systematic approach: "Look at what is specifically required, put it in a framework, and only then look up and fill in the information" [46]. This method demonstrates how breaking down tasks can help with prioritization and execution.

Respondents reported several strategies for increasing focus and productivity. Several individuals mentioned the Pomodoro technique [51], highlighting its popularity as a time management tool. Other approaches included eliminating distractions by turning off phones [8], using music to help focus, and using collaborative strategies [50]. These diverse methods highlight the importance of finding personalized strategies for maintaining focus in different work environments.

Approaches to deadline management varied widely among respondents, reflecting different personal work styles. Some individuals reported setting personal deadlines before official deadlines [24], while others used deadlines as a motivator [25, 43]. Interestingly, some respondents noted that they worked better under pressure and preferred to start tasks as late as possible [23]. This variability in approach was further illustrated by one respondent who described starting large projects early but often experiencing burnout, leading to a return to the project close to the deadline. These contrasting strategies highlight the need for self-awareness in developing effective time management techniques.

Several respondents emphasized the importance of work-life balance and self-care in their time management approaches. Strategies included scheduling breaks [11], and accepting that some days will be more productive than others [30]. This recognition of the need for balance and self-compassion suggests a holistic approach to time management that goes beyond simply completing tasks.

Technology plays an important role in modern time management strategies. Respondents reported using digital tracking software such as RescueTime, Exist.io, and iOS screen time reports [60] to gain insight into their time use. Google Calendar was cited as a tool for time blocking and colour coding [57], while Pomodoro timers [51] were used to structure work sessions. The integration of these technological tools demonstrates how digital resources can enhance traditional time management techniques.

Many respondents described adaptive strategies based on personal insights. These included recognizing the need for time pressure to begin work [31], accepting that working under pressure can be effective [28], and emphasized the role of experience:

"With age, I've gained insight into what is realistic and achievable in terms of the many things I would like to take on" [35]. These reflections underscore the evolutionary nature of time management skills and the value of self-awareness in developing effective strategies.

The variety of time management strategies reported by respondents underscores the personal nature of effective time management. While common themes emerged around planning, prioritization, and self-awareness, the variety of approaches underscores the importance of individuals developing strategies that fit their unique work styles and circumstances. This variability suggests that prescriptive, one-size-fits-all approaches to time management may be less effective than encouraging individuals to experiment with different techniques and reflect on their effectiveness. Future research could examine the effectiveness of these other strategies across academic disciplines and personal characteristics. Such research could lead to more tailored time management recommendations for students and professionals, recognizing individuals' different needs and working styles. In addition, longitudinal studies could examine how time management strategies evolve over an individual's academic and professional career, providing insights into developing these essential skills over time.

3.3.2.6   Task-Commitment and Getting Started

Table 5 What do you need to get started on an assignment? (H.E. survey)

Statement	Frequency
Clarity in the assignment helps: *this* is where I need to get started.	39
I need space to find my own path within an assignment (not too tightly defined).	24
Motivation is important: what do I need this assignment for/how does this fit into training/long-term development.	39
It has to be offered top-down (big picture and how this assignment fits into that.	33
I experience fear of failure/ if I can't do it well then don't (perfectionism) and therefore find it difficult to get started.	28
Other: it needs to be useful for my own development	1
Other: I need to create an overview for myself and once that is perfect, I can write.	1

The table presents a summary of the preferences and challenges reported by respondents when approaching assignments. The majority (39) indicated that having clarity

regarding the assignment is beneficial in initiating the commencement of the task, while 38 respondents underscored the significance of comprehending the assignment's relevance to their long-term objectives or professional growth. A significant proportion of respondents (33) preferred a top-down approach, whereby they could initially gain an overview of the assignment and comprehend its position within the broader context. A notable number (24) expressed a desire for autonomy in navigating the assignment rather than a highly structured approach. Only a small number of respondents (8) reported experiencing perfectionism or a fear of failure, which can impede their ability to initiate assignments.

3.3.2.7 Exams and tests: Multiple choice or Open-ended questions

Table 6 Exams and tests, exploratory (H.E. survey).

Statement	Frequency
I really like multiple-choice questions.	19
Multiple-choice questions distract me: when I think about it, I can always think of situations under which multiple answers are possible.	46
In multiple-choice and open-ended questions, I struggle to understand the question.	7
In open-ended questions, I struggle to make my answer specific (answer the question succinctly).	29
When writing a paper/essay, I struggle to limit myself (word count).	32
When writing a paper/essay, I struggle to understand the assignment.	13
When writing a paper/essay, I find it important to write a plan of action/outline.	22
In open-ended questions/papers/essays, I noticed that I did not name the important concepts (that felt 'redundant'/ I ran out of space/ I went right into 'depth').	20

The results demonstrate that gifted students may benefit from implementing bespoke examination strategies. The multiple-choice format can prove challenging for many gifted individuals who may perceive many potential responses, which can prove distracting. To address this issue, it may be beneficial to incorporate more nuanced, open-ended questions that allow students to demonstrate their broader understanding. However, in open-ended or essay-based examinations, students frequently struggle to

narrow their thoughts or stay within word limits. Providing clear guidelines, such as requiring an outline or plan of action, can assist them in organizing their thoughts and focusing on key concepts. Furthermore, examination questions must be clearly worded to minimize confusion and allow these students to demonstrate their depth of knowledge without becoming overwhelmed by the details.

3.3.2.8 Group work

Table 7 Group-work experiences (H.E. survey)

Statements	Frequency
It is important for me to know my role within the group.	23
Clear agreements are important for the success of the group assignment.	33
It regularly appears that communication problems/misunderstandings arise because we do not express our expectations within the group.	14
A clear division of tasks is important.	36
In the end, I am the one who has to do all the work.	22
I see a group assignment as a necessary evil.	30
Other statements indicate that the difference in pace or motivation (last-minute-ness) makes it frustrating.	15
Other: I have realized I can learn something from others.	1

The results of the survey indicate that gifted students hold ambivalent attitudes towards group work. A significant number of respondents highlighted the importance of clearly defined roles and task divisions within the group. This is evidenced by the high number of respondents who identified the value of knowing their role (23), having clear agreements (33), and task division (36). However, communication difficulties are frequently reported, with 14 respondents indicating that misunderstandings often arise due to unspoken expectations. A notable proportion of respondents (22) indicated that they often assume the majority of the workload, while 30 individuals described group work as a "necessary evil." Additionally, frustration arises from discrepancies in work pace or motivation among group members, such as last-minute work habits (15). Nevertheless, one respondent acknowledged that they can still learn from others in group settings.

3.3.2.9 Writing Assignments and Theses

Large-scale writing assignments, such as essays, extensive research papers, or theses, present unique challenges and opportunities for students in higher education. This overview explores students' experiences with these projects, focusing on key aspects such as supervision, deadline management, the initiation process, execution, scope limitation, planning, and communication with supervisors.

Supervision and guidance: The quality and nature of supervision emerge as a critical factor in students' experiences. Some students report positive experiences with supportive supervisors who provide clear guidance and feedback [8, 39]. Others, however, describe inadequate or inconsistent supervision [1, 25, 33]. One student noted, "My supervisor knows my talents and learning needs. This makes targeted, individualized guidance very enjoyable" [16]. Some value close supervision [8], while others prefer more independence [58]. This variability underscores the need for flexible approaches to supervision tailored to students' needs.

Initial process and definition of scope: Many students report difficulties in the early stages of their projects, particularly in defining the scope and formulating the research questions. One student articulated this challenge: "Defining the goal is very difficult for me. Everything is interesting, so I want to do everything" [32]. Another noted, "The hardest thing is the beginning, where I have to commit myself argumentatively and stylistically" [49]. The ability to narrow down topics and set realistic goals seems to be a common struggle. Some students benefit from supervisor support in this area [15], while others find it challenging when given too much freedom or when the supervisor does not understand the topic [56].

Execution and time management: Students' experiences with project execution and time management vary widely. Some report efficient work processes [50], while others struggle with procrastination and meeting deadlines [23, 34]. One student shared, "I never meet deadlines and always manage to push them back" [10]. Several students mentioned the effectiveness of setting personal deadlines or having interim deadlines imposed by their programs [52].

Perfectionism and depth of research: A recurring theme is the challenge of balancing the depth of research with the need to complete the project within a given time frame.

Writing Process and Structure: The writing process itself poses unique challenges. Some students struggle to translate their complex thoughts into a coherent written

structure [29]. Positive experiences were often associated with clear structure and guidelines. One student appreciated "clear guidelines on what to do each week, good examples. A graduation buddy to motivate each other" [8].

Emotional and Psychological Aspects: Many responses reveal the emotional toll of large writing projects. Students report feelings of anxiety, stress, and self-doubt [26, 41]. Others, however, find the process rewarding and enjoyable when it aligns with their interests [43, 52].

Interdisciplinary and collaborative aspects: Some students highlighted the benefits of multidisciplinary approaches and peer collaboration [2, 40]. These experiences often led to more positive outcomes and improved learning.

Students' experiences with major writing assignments and theses are varied and complex. Key factors influencing their experiences include the quality of supervision, clarity of expectations, personal time management skills, and the ability to define and limit the scope of their work. Such projects' emotional and psychological aspects also significantly influence students' experiences.

These findings suggest that a one-size-fits-all approach to supervising and structuring large writing projects may be ineffective. Instead, a more flexible, individualized approach that considers students' diverse needs, work styles, and emotional responses may lead to more positive outcomes.

3.3.2.10   Writing a Dissertation

Ph.D.-candidates and postdocs frequently engage in introspective reflection on the multifaceted challenges inherent to their academic pursuits, particularly in relation to maintaining focus, productivity, and navigating ambiguous expectations. A pervasive sentiment that only a select few will perceive their work can give rise to feelings of futility, compounded by the scarcity of supervisor feedback, which leaves them feeling adrift.

One of the most significant challenges is maintaining focus in the absence of immediate deadlines. Many researchers are prone to being easily distracted by tasks that are not essential to their work, such as browsing the internet or attending to unrelated activities. This proclivity is associated with the unstructured nature of academic work, wherein long-term objectives can obscure the pathway to the completion of daily tasks.

The intricacy of academic work serves to compound this frustration. Researchers frequently encounter difficulties integrating the many ideas that emerge during their work into a constrained academic format. This can give rise to feelings of dissatisfaction despite paradoxical confidence in the high quality of their eventual output. The management of extensive bibliographies and the acquisition of new skills also contribute to feelings of being overwhelmed, particularly in the absence of consistent supervisory support.

A frequent tension exists between the structured, methodical approaches traditionally valued in academia and researchers' preferences for more holistic, intuitive methods. This disconnect has the potential to impede creativity and innovation, which may, in turn, lead to further frustration. The necessity to produce high-quality work in a timely manner introduces a considerable amount of stress, as researchers must reconcile their aspiration for excellence with the imperative to maintain academic autonomy. While the process of revising work can be perceived as onerous, feedback from peers or editors frequently offers invaluable insights that enhance clarity and motivation.

Another significant challenge is determining when work is of an acceptable standard. This is further complicated by the necessity to meet institutional standards that may not align with personal working styles. Procrastination is a prevalent issue, with many postponing tasks until deadlines instilling a sense of urgency. This frequently has its roots in perfectionism and the anxiety associated with the prospect of producing work that is of a subpar standard despite a history of success.

Furthermore, social dynamics within the academic community can result in feelings of isolation. Many researchers report feeling disconnected from colleagues who prefer less intellectually rigorous discourse. Such circumstances may prove alienating for those deeply invested in their research and craving meaningful dialogue.

In essence, the academic path necessitates harmonizing creativity with structure, independence with the necessity for support, and autonomy with the importance of collaboration. The challenges faced by those pursuing a PhD or a postdoctoral position extend beyond the intellectual realm, encompassing emotional and psychological aspects. These individuals often operate within isolated environments, which can compound the difficulties they encounter. Notwithstanding the aforementioned difficulties, there persists a pervasive conviction that the fruits of their labour will ultimately prove invaluable, even if the process is beset with frustration and uncertainty.

3.3.3   Support and understanding

3.3.3.1   Key Skills and Considerations for Coaching Gifted in H.E.

Educating gifted individuals presents unique challenges and opportunities. This analysis examines stakeholder perspectives on essential skills and considerations for the next generation of gifted learners and highlights key themes that emerge from their responses.

Many respondents underscored the necessity of instructing gifted individuals in effective learning strategies. This encompasses developing metacognitive awareness and adapting learning techniques to align with individual cognitive styles [1, 2, 3, 15, 16, 19, 24, 32, 46]. Furthermore, several responses emphasized the necessity of top-down approaches to learning that align with the cognitive preferences of many gifted individuals. This includes the instruction of students in transforming bottom-up courses into top-down learning experiences [17, 40]. Developing planning and organizational skills was also frequently identified as a critical area for gifted learners. This encompasses time management, work structuring, and maintaining focus on long-term goals [8, 16, 19, 24, 32, 35, 37, 46].

Regarding social-emotional development, numerous responses underscored the significance of self-awareness and identity, particularly recognizing and accepting one's giftedness. This can assist individuals in effectively managing their distinctive strengths and challenges [5, 6, 22, 25, 41]. Furthermore, emotional regulation and resilience were frequently referenced, emphasizing fostering self-confidence and addressing issues such as perfectionism, fear of failure, and performance anxiety [13, 22, 25, 26, 31, 43]. Furthermore, enhancing social and communication abilities, particularly in interactions with non-gifted individuals, was a crucial factor in enabling gifted individuals to express themselves without needing to conceal their abilities [21, 23, 45].

The maintenance of motivation was identified as a significant challenge by numerous respondents, particularly in tasks that are not inherently engaging for gifted individuals. Developing strategies to overcome this challenge was identified as a crucial necessity [7, 16, 19, 47]. Another common thread was the challenge of balancing perfectionism with productivity. Gifted individuals frequently encounter difficulties in

maintaining high standards while managing realistic expectations. They must learn to discern when "good enough" is sufficient to avoid unnecessary stress [26, 37, 47].

The educational environment and support system were also discussed, with many respondents emphasizing the necessity for more flexible and individualized approaches to curriculum and teaching methods. This encompasses providing free choice of tasks and adapting teaching methods to the specific needs of gifted learners [12, 14, 28, 40]. Furthermore, several responses emphasized the necessity of training educators to more effectively understand and support gifted students. This includes ensuring educators recognize alternative problem-solving approaches and avoid misinterpreting gifted behavior [9, 14]. Additionally, some respondents advocated for a more holistic approach to education that balances academic achievement with personal development. This approach should foster creativity, emotional intelligence, and life skills [27, 29, 42, 44].

The perspectives gathered in this analysis reveal a multifaceted approach to gifted education. Key focus areas include developing metacognitive skills, fostering social-emotional growth, addressing motivational challenges, and creating supportive educational environments. These findings can inform the development of more effective educational strategies for gifted learners, ultimately enabling them to reach their full potential while maintaining a balanced and fulfilling life.

Ph.D.candidates and Postdocs seem to have developed their strategies to strike a balance between productivity and physical well-being. A common approach is to seek external support, such as relying on partners for household responsibilities or turning to mentors and coaches when supervisors are unresponsive. This network of support mitigates the pressure of having to resolve all issues independently. Another widely adopted strategy is setting flexible daily goals. Many researchers establish particular objectives for each day but permit themselves the latitude to modify them if circumstances require. This approach helps to maintain progress without inducing unnecessary stress. Adopting a long-term perspective is similarly beneficial. Some researchers find reassurance in the knowledge that incomplete ideas can be revisited during future work, such as in PhD projects, thereby reducing the pressure to perfect every detail in the current task.

The creation and modification of schedules are paramount for the effective management of workload. It is important to allow flexibility in these schedules, with updates

made as needed based on the evolution of tasks. This adaptive approach prevents the overwhelming pressure of falling behind and provides a sense of control over progress. Furthermore, reflecting on past achievements can help alleviate pressure and provide a sense of accomplishment.

A common practice among researchers is to divide larger tasks into smaller, more manageable units. This approach renders formidable projects more attainable and engenders a perception of advancement, even concerning incremental accomplishments. Creating written outlines for papers and the subsequent adherence to them represents a method of maintaining structure and preventing the loss of focus on tangential ideas. Others employ schemas, commencing with general texts and incorporating more specific references as they progress, which facilitates the management of the intricacies inherent to extensive bibliographies. The issue of procrastination can be addressed by creating external pressure, such as informing one's supervisor of impending deadlines or working towards conference submissions. This approach facilitates the maintenance of task progress by fostering accountability. Another crucial strategy for circumventing the distress associated with perfectionism is the incorporation of early feedback loops. Some researchers submit work that is not yet complete to allow for corrections and improvements through ongoing feedback. This approach helps to reduce the fear of submitting work that is not yet ready for publication.

For those who flourish when presented with a variety of tasks, balancing core research responsibilities with additional projects, courses, or challenges can help prevent boredom. Such supplementary pursuits offer intellectual stimulation while remaining aligned with the core research objective. Similarly, engaging in activities that are not directly related to academic success but which are pursued for their intrinsic value can help to alleviate the constant pressure to excel. This alteration in perspective facilitates the undertaking of more substantial projects with a more tranquil demeanour.

Researchers who are neurodivergent or facing unique challenges often find peer support groups beneficial. The formation of activities where they can share coping strategies creates a sense of community and provides practical solutions for navigating the academic environment.

In summary, the strategies used by Ph.D.-candidates and postdocs reflect a balance between structure and flexibility, external support and self-management, and tackling

procrastination through accountability and incremental progress. These personalized approaches allow researchers to navigate the complexity of academic life while maintaining their well-being.

3.3.3.2 Specific support needs in Higher Eduction

Awareness and understanding of giftedness in education: Many respondents pointed to a lack of awareness of giftedness in schools and higher education. Schools often don't fully understand the legal and practical options for supporting gifted students, leading to inadequate support. In addition, there are misconceptions about giftedness itself, with people often assuming that being gifted automatically leads to high grades, when for many, giftedness also brings significant challenges. This lack of understanding extends to adults, who are deemed to know how to handle academic tasks. In addition, higher education institutions may not always recognize the needs of gifted students, leading to misinterpretations of their abilities or struggles. Misunderstandings also arise because gifted individuals often ask complex or unconventional questions that may be misperceived as odd or unnecessary.

Support and Guidance for Gifted Individuals: The need for better support systems for the gifted was a recurring theme. Many respondents felt that gifted students are often overlooked because it is assumed that they can do without help. Teachers and schools should focus on providing equal support for gifted students and those who are struggling academically. Some also mentioned the limitations of rigid educational structures, such as rubrics, which can stifle creativity and independent thinking. Gifted individuals may also experience boredom due to a lack of stimulation and challenge, emphasizing the educational system's need for individualized, attentive support. The financial burden of being tested for giftedness in adulthood is another issue, with many calling for schools to cover these costs to facilitate appropriate guidance [e.g. 7, 13].

Challenges with the educational system: Many gifted individuals feel their potential is not fully realized because the current educational system forces them into a rigid structure. The focus in classrooms is often on struggling students, leaving gifted students without sufficient attention or resources. This imbalance can lead to frustration among gifted students who feel unsupported. In addition, some students noted that structured feedback, while helpful in clarifying expectations, can limit creativity and

independent thinking. They expressed a desire for more flexibility in their education, particularly the ability to work at their own pace and in an environment that encourages creativity and autonomy rather than rigid group-work structures.

Emotional and social aspects of giftedness: While giftedness is often perceived as a positive characteristic, it can present significant emotional and social challenges. Many gifted individuals have had negative experiences, feeling misunderstood or unsupported in educational settings. Social isolation is common, as they often feel disconnected from their peers or misunderstood by educators. This disconnect can lead to stress and feelings of alienation, compounding gifted students' difficulties. Some respondents also mentioned the challenge of being open about their giftedness, as it can sometimes be perceived as arrogance, which can make them reluctant to talk about it at all.

Recommendations for Improving Education: Respondents offered several suggestions for improving the educational experience of gifted students. They suggested that curricula should be more tailored to capitalize on the creativity and individuality of gifted students. Educators and support staff need more training to identify and support giftedness appropriately. Flexibility in academic programs, such as offering online courses or self-paced learning, would help gifted students thrive. In addition, there should be a greater focus on fostering critical thinking and independence rather than simply teaching students to meet rubric requirements.

3.3.3.3   Specific support needs for Ph.D.-candidates and Postdocs

While some individuals indicate satisfaction with their current supervisory arrangements, others express frustration or cite unmet needs. Some key themes emerge from an analysis of the responses provided.

The issue of autonomy and trust: A significant number of respondents underscored the significance of autonomy in their professional endeavors. Such individuals express appreciation for supervisors who afford them the autonomy to manage their own time and projects. One respondent notes that autonomy also entails the freedom to be perceived as an individual with a life outside of one's professional responsibilities. This indicates that individuals pursuing doctoral degrees and postdoctoral research positions place a high value on the capacity to reconcile their academic pursuits with other personal and professional obligations.

Requirement of feedback and support: Although autonomy is of paramount importance, respondents also indicate a necessity for prompt feedback and assistance. One individual states, "I require support and feedback," underscoring the significance of constructive input from supervisors. The respondents indicated that regular meetings and the ability to seek advice when needed are beneficial aspects of the supervisory process.

Tailored Approaches: The responses indicate that a universal approach to supervision is an ineffective strategy. Some individuals flourish with minimal oversight, while others benefit from more structured guidance. One respondent notes that while they do not respond well to rigid deadlines, they do benefit from regular meetings with their supervisors. This highlights the necessity for supervisors to tailor their approach to align with each individual's unique working style and requirements.

Acknowledgment of disparate modes of thought: A number of respondents indicate that they perceive themselves as being distinct from their colleagues and as having approaches to their work that are unconventional. One respondent notes, "I frequently engage in unconventional thinking, yet I work in a research environment where this is not perceived as a valuable quality." This indicates a necessity for supervisors to demonstrate greater receptivity to diverse thinking styles and methodologies in research.

Effective communication and the establishment of clear expectations: Some respondents indicate that they experience frustration when expectations or communication from supervisors are unclear or inconsistent. One respondent notes that a problematic aspect of the appointment system is that it allows others to unilaterally decide that tasks should be completed in a different manner. This underscores the necessity of transparent and consistent communication, as well as mutual respect for established plans and deadlines.

Mental Health and Well-Being: Responses address issues pertaining to mental health, including burnout, anxiety, and the necessity for emotional support. One respondent states, "Mental support is of paramount importance." This indicates that effective coaching should encompass awareness of and support for the mental well-being of Ph.D.-candidates and postdoctoral researchers.

Intellectual stimulation and challenge: Respondents indicate a preference for intellectual stimulation and the chance to engage with various ideas. One respondent stated a preference for a workload that allows for simultaneous engagement with multiple

projects, which they perceive as a means of maintaining a sense of intellectual challenge. This suggests that doctoral students and postdoctoral researchers frequently seek a balance between concentrated research and broader intellectual engagement.

Institutional Support: Some responses indicate that broader institutional issues, such as bureaucracy and inflexible assessment structures, can impede the progress and well-being of Ph.D.-candidates and postdoctoral researchers. One respondent proposes that universities and colleges require greater flexibility and diversity in their organizational structures. Related to this is that 40% of the Ph.D.-candidates/Postdocs indicate they would like to meet with gifted peers within their work environment and 35% say they might be interested.

While some doctoral students and postdoctoral researchers report positive experiences with their supervisory teams, there is clearly room for improvement in many cases. The optimal coaching approach seems to be one that strikes a balance between autonomy and support, facilitates clear communication and expectations, acknowledges diverse thinking styles, and is sufficiently flexible to adapt to individual needs. Furthermore, institutions may need to re-examine some of their structures and processes with a view to providing more effective support for the development and well-being of Ph.D.-candidates and postdocs. Further research could investigate these issues in greater depth and evaluate the efficacy of interventions designed to enhance the coaching and support provided to early-career researchers.

4 Reflection

Respondents—both in higher education and PhD candidates and Postdocs—signal that there is too little knowledge and understanding of the different ways in which gifted people think and approach their studies or research. The surveys give rise to the suspicion that higher education and the research world are not very open to the creativity and outside-the-box thinking of gifted people. It should become a standard part of the University Teacher's Qualifications, and which student advisors have additional knowledge on the topic should be clear. The currently dismissive attitudes from educators and advisors are reprehensible.

While further research is – of course – required, this explorative study does give some pointers to issues that the respondents currently perceive. The top-down approach – explaining how a course fits into the studies – should be covered not only in the study's manual but should be of little effort to explain to the students at the start of a course. Those needing this information are helped with it, and those that do not need it, are not bothered by hearing it. Additional flexibility would be advisable for students who feel pressured or stressed due to groupwork. Flexibility in this regard would be advisable. The didactical intention behind an assignment should be clear: *why* is it necessary to do work as a group? Is that because the educator does not want to have too much to correct, or is it because together, the students will have the benefit of *getting further?* If the latter, is the argument, the question arises whether this is applicable to gifted students who perceive being slowed down by their fellow students.

Furthermore, testing students through multiple-choice questions might be a fast way of examining them, but it is questionable whether this method is hampering the success of gifted students. As success is – according to several respondents – still measured in how high their grades are; and thus standing in the way of joining honours programs an apparent spiral of misunderstandings seems to be in place. Because the information that is being communicated is (apparently) lacking crucial details, gifted students either end up asking a lot of questions that nerve their educators or they become introverts and focus too much on their work, and perfectionism spins out of control. While the communication fails on multiple accounts, respondents feel unheard, misunderstood, and even mocked because of their 'arrogance'.

It is clear: communication leaves room for improvement. Programs addressing issues such as not having learned any learning strategies, time management and overcoming motivational issues should be available. Ideally, these should be offered within a group of peers, allowing the exchange of experiences. However, it is also omnipresent that not everyone has a clear view or acceptance that they might be gifted. Or, when they do know, they may still struggle with what the terminology entails – primarily because of the relatively narrow application within an educational context.

As these individuals often benefit from seeing their abilities in a broader framework and understanding the impact of e.g. stress, or their own characteristics the models that have been listed in the section on *practical, personal percipience modelling* can be helpful. It should be stated that *models* are not the same as reality. As giftedness is a multidimensional characteristic that only occurs in less than 2% of people, and *each* of these individuals has its own peculiarities, it is important to realize these models will never do justice to the topic of giftedness. It is the gifted person who is qualified to explain how they feel and what works for them. While it may not be possible to grant every single request, it should be possible to make requests and not have to sit through lectures obligatory because someone wrote this in the manual as this fits common learning theories. More room for alternative approaches to show that one has reached the learning goals of a course – other than just writing an exam (that is perceived as unclear) would be an interesting option for many students that do not feel that they have autonomy to make their own decisions and therefore their motivation is crippled.

5   Conclusion

This research comprehensively explores the challenges faced by gifted students in higher education PhD candidates, and postdoctoral researchers. It underscores the need for specialized support structures that promote academic success and nurture gifted individuals' emotional and social well-being.

A central finding of the research is that traditional educational models and pedagogical approaches often fail to address the unique needs of gifted students. Conventional methods, including standardized assessments and inflexible curricula, tend to stifle these learners' cognitive and creative abilities. Instead, the study reveals that gifted students typically thrive in environments that offer personalized approaches, foster deep comprehension, and allow for meaning-directed learning styles. These learners benefit from strategies emphasizing self-regulation, metacognitive awareness, and intrinsic motivation.

The empirical research conducted as part of this thesis shows significant emotional and social challenges gifted students encounter: feelings of isolation, overwhelming academic expectations, and a sense of being misunderstood by peers and educators. Issues such as burnout, perfectionism, and frustration with rigid educational structures emerged as common themes. Additionally, the study highlights a frequent mismatch between the cognitive abilities of gifted students and their emotional or social development, often leading to difficulties in balancing academic pursuits with personal well-being.

The research proposes several key recommendations for higher education institutions in response to these findings. It advocates for implementing more flexible, supportive learning environments tailored to the specific needs of gifted students. This includes creating spaces encouraging self-regulated learning, intrinsic motivation, and achieving "flow" states – where students are optimally challenged and engaged. The research suggests that tools like time-blocking, project-based learning, and personalized mentoring can help gifted students manage their time, maintain motivation, and achieve academic and personal goals.

Furthermore, the study emphasizes recognizing and addressing the emotional sensitivities often present in gifted individuals. It calls for educational institutions to provide academic support and emotional and psychological assistance through tailored mentorship programs, peer study groups, and specialized counselling services.

Thus, this research urges a fundamental shift in how educational systems approach giftedness in higher education. By moving away from one-size-fits-all models and embracing more personalized, flexible approaches, institutions can better support gifted students in their pursuit of academic and personal excellence. The research underscores the significant societal and individual costs of failing to meet the needs of gifted students and argues that with the right interventions, these individuals can unlock their full potential, thereby contributing to innovation and progress in society. Educators and supervisors can empower gifted learners to thrive in academia and beyond by integrating theories of self-regulated learning, motivation, and allowing room for autonomy. Only that way can they exert control and have execution power!

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Annexes

Annex A. Giftedness in Higher Education

The survey is divided into four sections, each addressing a distinct aspect of the respondent's experience. Part 1 is concerned with the personal context of the respondents and includes questions on demographic details, giftedness, and cognitive traits. Part 2 of the survey pertains to the respondent's educational background, encompassing their field of study, the institution they attend, and the level of support they receive regarding their giftedness. Part 3 delves into the challenges encountered by respondents in higher education, with a particular focus on time management, study methods, and motivation. Finally, Part 4 allows respondents to offer additional feedback and suggestions, particularly concerning skills for future generations of gifted individuals.

The data of the 60 people surveyed can be found here: **10.5281/zenodo.13925852.**

Annex B. Maximizing Potential: Ph.D.-candidates and Postdocs

This survey aims to gather information about the experiences of gifted PhD and postdoctoral students, focusing on their learning challenges and supervision needs. The survey commences with demographic inquiries, including gender, age, and field of expertise. It then proceeds to address the subject of giftedness diagnosis and IQ. Subsequently, the survey delves into the academic challenges encountered during the pursuit of a Bachelor's or Master's degree and doctoral research through the use of open-ended questions. The survey also investigates coping strategies and experiences with supervision, with respondents invited to describe effective and ineffective strategies. Additionally, the survey addresses whether respondents' needs related to their high ability are being met and if they have discussed this with their supervisors. Finally, it gauges interest in academic peer networking opportunities for gifted individuals. The survey combines multiple-choice and open-ended questions, allowing for both quantitative and qualitative data collection. It emphasizes confidentiality and will enable respondents to receive results or participate in follow-up questions.

The data of the 20 people surveyed can be found here: **10.5281/zenodo.13925870.**

Annex A. Giftedness in Higher Education

This survey is designed to understand the specific challenges gifted students face in higher education. This initial survey is conducted as part of my specialization for the ECHA course, to identify the bottlenecks faced by students in higher education. The survey consists of four parts: 1. The first part focuses on you person some general questions about who you are. 2. The second part deals with your choice of a specific course. 3. In the third part, we zoom in on your focuses within your program, with a special focus on knowledge and training, educational adjustments, and thesis guidance. This part thus focus, thses main student experiences. 4. The fourth and final part will give you the opportunity to raise any gaps or comments you may have in my research.

The ultimate goal of this survey is to collect data for my ECHA course. At the end of the survey, you can indicate whether you want to be kept informed of the results or participate in any follow-up research. The data collected, excluding e-mail addresses and other personally identifiable information, will be stored in Zenodo, an online repository, to comply with the FAIR principles of discoverability, accessibility, interoperability, and reusability.

Thank you very much for your cooperation!

Annemieke Romein

Part 1. Context or you as a person and what education you are currently pursuing

In this part of the survey, I focus on questions that relate to you personally. It is important for me to stress that my intention is not to pigeonhole you. I am fully aware that my thesis will be read by policymakers. Therefore, I aim to provide a translation so that even people who are not necessarily gifted can understand what situations are perceived as challenging. The literature shows that these challenges can vary depending on factors such as gender, age or certain character traits.

It is important to mention that the fact that I am asking these questions does not imply that I personally agree with all views, nor do I automatically expect you to. However, it does give me an opportunity to connect with or critically assess the existing literature.

Which country are you from?	Open question
How do you identify yourself?	Male Female Other

How old are you?	Younger than 15 years.
	15-17 years
	18-20 years
	21-23 years
	24-26 years
	27 years or older
	I prefer not the answer
Have you been labelled gifted through an official IQ test?	Yes
	No
	No, but my whole family has been tested gifted
	Other,…
What does giftedness mean *to you*?	Open question
Kazimierz Dąbrowski a Polish researcher describes 'nadpobudliwość'. This is often used with 'overexcitability' in or as 'superstimulatability' and is said to be present in (at least) one in five people. Do you recognise yourself in one or more of the descriptions below?	Psychomotor overexcitability
	Sensitive overexcitability
	Intellectual overexcitability
	Emotional overexcitability
	Imaginational overexcitability
	None of the above
Is there any 'double gifted'? (Dyslexia, ADHD, ADD, Autism, etc.). If yes, please mention.	No
	Yes, please mention…

Part 2. Education

The following questions focus on your study programme and the (possible) support you receive there. The information on courses/institutions will be summarised at an aggregated level so that it will not be directly traceable.

Where are you studying? Please name the institution you are affiliated with.	Open Question
What are you studying?	Open Question
What motivated you to choose this programme?	
Does your education know about your (suspected) giftedness, i.e. have you passed this on in a way somewhere in the past few years?	Yes No
Are you getting adequate support in your education (regardless of whether they are aware of your (suspected) giftedness)?	Yes No Other
Please explain why you did/did not tell your education about your (suspected) giftedness.	Open Question
Did you start your studies at an earlier age than other students?	Yes No
If you started your studies younger than average, did your lecturers or student adviser notice this and did they talk to you about any additional needs you had?	Open Question
Does your (suspected) giftedness manifest itself in educational situations or mainly outside them?	Within the educational environment Outside the educational environment (e.g. hobbies, volunteer work, politics, etc.)

Part 3. Challenges in higher education

In this section of the survey, we focus on three core aspects of the learning process in higher education:

- **Time Management:** We examine the techniques you use to organise your studies efficiently and meet deadlines.
- **Study Methods**: We are interested in how the curriculum offered matches your way of learning, specifically targeting gifted students.

- **Testing**: We want to gain insight into your preparation strategies for exams and tests, and how you cope with the pressure of testing.

The aim is to understand how these elements influence your study experience and where possible improvements can be made.

Have you ever had (additional) training to 'learning skills'?	Yes No
Can you give more details about that training, such as the name or a description, and what *you* learnt from it?	Open Question
Would you need 'learning to learn' training focused on skills within *higher* education?	Yes No Maybe
How good are you at time management?	Scale 1 to 10 (Very bad (I never get anything done on time; 10 = Very good (I keep time))
Which statement/statements about time management suit you? (more answers possible!)	o I never learned. o I need time pressure to get something done. o I want to do more than what I have time for. o If it 'has to' then I no longer feel like it (I want to be able to decide for myself). o My challenge is scheduling (with some flexibility). o I struggle with 'starting'/'getting started'. o I have no need/desire to work hard, it's not for me. o I am very optimistic that I will finish something, but run out of time at the end.

	o When I'm busy, I have trouble stopping (I keep researching out and/or writing even more).
	o I experience moments of 'burn out' (doing too much/overloaded) and 'bore out' (too boring/under stimulated).
	o I lose a lot of time because I struggle to distinguish main and side issues ('everything is interesting anyway').
What strategies have you developed yourself to deal with time management challenges? (Remember, there are no right or wrong answers!)	Open Question
What happens in your mind when you start working on an assignment?	☐ Clarity in the assignment helps: this is where I need to start. ☐ I need space to find my own path within an assignment (not too tightly defined). ☐ Motivation is important: what do I need this assignment for/how does this fit into training/... ☐ It has to be offered top-down (big picture) and how does this assignment fit into that. ☐ I experience fear of failure/if I can't do it well then don't (perfectionism) and therefore find... ☐ Other
Where do you mainly find your motivation: in intrinsic factors (such as personal interest or passion) *or* extrinsic factors (such as getting your degree)? And to what extent is this motivation addressed within your education?	Open Question

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How important is belief in your own ability (self-efficacy) to your motivation to complete a task?	Scale 1 to 5 (1 = not important; 5 = very important)
How important is seeing the value of a task (task value) - understanding the bigger picture and purpose - to your motivation?	Scale 1 to 5 (1 = not important; 5 = very important)
How important is the experience of sufficient or appropriate support from those around you (fellow students, teachers, family, friends, etc.) to your motivation?	Scale 1 to 5 (1 = not important; 5 = very important)
Within your programme or individual subjects, is attention paid to how the lessons fit into the bigger picture of the subject or programme?	Scale 1 to 5 1 = Rarely (I have to do everything).; 5 = always
Can you name situations in which you can concentrate well? For example, do you succeed better when the subject matter particularly appeals to you? Could you give a specific example?	Open Question
What makes you *unable to* concentrate?	Open Question
Do you have a good idea of what your teachers expect of you in a subject when you think about what you need to learn for the subject?	Open Question
Do you experience - at any time - that you know you once heard/learned something, but you have not 'stored' the information properly in your memory?	Yes No
Which statements are true for you? Multiple answers possible.	☐ Multiple-choice questions distract me: when I think about it, I can always think of situations under which multiple answers are possible. ☐ In open-ended questions, I struggle to make my answer specific (answer the question succinctly). ☐ When having to write a paper/essay, I struggle to limit myself (word count).

	☐ When writing a paper/essay, I struggle to understand the assignment. ☐ In open-ended questions/papers/essays, I notice that I did not name the important concepts (that felt 'redundant'/ I ran out of space/ I went right into 'depth'). ☐ When writing a paper/essay, I find it important to write a plan of action/outline. ☐ I really like multiple-choice questions. ☐ In multiple-choice and open-ended questions, I struggle to understand the question.
How do you like group assignments? What works/what doesn't? (multiple answers possible)	☐ "It is important for me to know what my role is within the group." ☐ "Clear agreements are important for the success of the group assignment." ☐ "It regularly appears that communication problems/misunderstandings arise because we do not express our expectations within the group." ☐ "A clear division of tasks is important." ☐ "In the end, I am the one who has to do all the work." ☐ "I see a group assignment as a necessary evil."
Can you share your experiences about writing a final thesis, thesis or dissertation, or any other major writing assignment? Consider aspects such as supervision, setting and meeting deadlines,	Open Question

the starting process, carrying out and possibly limiting the assignment, planning and consulting with your supervisor.	
In what ways do you think guidance, specifically for you as a gifted person or for gifted people in general, could be improved?	Open Question

Part 4. Free space

Here is space to add some additional comments.

Are there certain skills you would like to see offered to the next generation of (presumably) gifted people?	Open Question
What specific skills would you like to see offered to future generations of (probably) gifted people?	Open Question
What else would you, Annemieke Romein, like to pass on? This could relate to something that may have been overlooked, or something you would like to say for the benefit of this study or about giftedness in higher education.	Open Question

Annex B. Maximizing Potential: Ph.D.-candidates and Postdocs

For my thesis (ECHA 2024 - ICBF Münster) I am writing on the topic of 'learning to learn' and supervising PhD and Postdocs. During your studies, you may have - at points - encountered challenges, and likewise so during your PhD or possibly during your Postdoc too. While little has been written on these (possible) struggles, the questions below are meant to explore the topic.

The outcome of the questions will be stored on Zenodo, *without* any information that could be traced to a person directly [in some cases this might mean omitting some information or reformulating it].

Question	Answers
What is your gender?	Male Female Other
What is your age?	20-29 30-39 40-49 Other/ do not want to disclose
What is your field of expertise/ academic discipline?	Open Question
Have you ever been diagnosed for high giftedness/ done an IQtest?	Yes No
Are you twice gifted? (e.g. do you have autism, or dyslectic etc.)	Yes No
Does your supervisor know of your (possible) high ability?	Yes No
If you know your IQ, could you given an indication?	Under 130 130-144 145- 159 >160 I don't know Do not want to disclose
Can you please describe what you found challenging during your BA/MA regarding 'learning' (writing papers, sitting down to learn for an exam... anything)? Or may be you did not experience any 'I have to learn'-moments?	Open question
What do you find particularly challenging when writing a PhD? Please walk me through your routine/	Open question

struggles.	
Do you have 'tricks' how to deal with previously de-scribed struggles/ challenges?	Open question
When you look at how you are currently being super-vised or coached... what works for you/ what does not work for you?	Open question
What are your needs regarding your work/ supervision to meet your (possible) high ability? Are these current-ly met/ have you talked about this?	Open question
Would you have any need for 'meeting peers' within academia/ KNAW with regard to high ability/ high giftedness?	Yes No Maybe

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