Understanding the challenges of learning disabilities and psychosocial disorders

Corresponding author
Viktoriya Galitskaya
Net Media Lab Mind - Brain R&D IIT - N.C.S.R. "Demokritos"
Department of Primary Education, National and Kapodistrian University of Athens
vgalitskaya@yahoo.gr

Athanasios Drigas
Net Media Lab Mind - Brain R&D IIT - N.C.S.R. "Demokritos", Greece

Alexandros-Stamatios Antoniou
Department of Primary Education, National and Kapodistrian University of Athens, Greece

Abstract: Students with learning disabilities often experience a complex range of internal and external challenges that can significantly impact their overall well-being and development. Internally, these students may grapple with intense feelings of anxiety, depression, and physical complaints, which can lead to social withdrawal and diminished self-esteem. They may also face higher rates of bullying and social rejection, further exacerbating their psychosocial difficulties and negatively affecting their sense of belonging and acceptance. These learners are more likely to exhibit attention problems, poor concentration, and a wide range of emotional difficulties, which can further hinder their ability to engage effectively in academic and social settings. Behaviorally, students with learning disabilities may exhibit issues like attention deficits and socialisation challenges, stemming from underlying processing difficulties and challenges in understanding social cues and norms. They may also experience feelings of anger, frustration, and even aggressive behaviours, often as a result of their negative experiences and struggles with academic demands. Emerging research suggests that executive function deficits can contribute to these students' complex relationship between temperament and psychological difficulties. Problems with executive functions, such as attention, planning, memory, and flexibility, can significantly impact their cognitive and social-emotional development. Early interventions, such as video games, mobile apps, or STEM-oriented approaches, are crucial for addressing these multifaceted challenges and supporting the holistic growth and well-being of students with learning disabilities

Keywords: Learning Disabilities; Psychosocial Disorders; External problems; Internal problems;Executive Functions; Self-regulation

Introduction

Children with learning disabilities and psychosocial disorders require special attention and support to help them thrive in various aspects of their lives. Understanding their unique challenges and finding effective interventions is crucial for their development and well-being.

Educators and professionals must address the potential impact of psychosocial disorders on the academic and social functioning of students with learning disabilities (Alotiby et al., 2021). By recognising and understanding the complexities of psychosocial disorders in these children, they can implement appropriate intervention strategies to support them academically and socially (Sajan &

Sunitha, 2018). This is especially important because psychosocial disorders can significantly hinder a child's overall development and well-being.

Children with learning disabilities may face difficulties that result in not only academic gaps but also issues with their psychological and social well-being (Polychroni et al., 2013). This can lead to emotional, social, and behavioural concerns (Backenson et al., 2015; Wilmot et al., 2023).

Studies have indicated that children who have specific learning disabilities might face inner obstacles like depression, anxiety, and self-worth issues. Apart from these internal challenges, they may also confront external difficulties associated with socialisation and misconduct (Williams et al.,

2006). These problematic behaviours obstruct their social and psychological growth (Sofologi et al., 2022).

According to research by Barkauskienė and Bieliauskaitė in 2002, students with learning difficulties have more internal problems than external problems. Internal problems may involve physical complaints, feelings of isolation, anxiety, and depression. In contrast, they defined aggressive behaviour, delinquency, attention problems, and social problems as external problems (Barkauskiene&Bieliauskaite, 2002). Furthermore, children with learning disabilities may also experience difficulties in developing and maintaining positive relationships with peers (Polychroni et al., 2013) and adults (Rudiyati et al., 2019).

Internal Problems

Anxiety disorders are the most common mental disorders found in childhood and adolescence (Bosquet & Egeland, 2006) with an average age of onset of 11 years (Kessler et al., 2005). According to Nelson and Harwood, 7 out of 10 students who experience anxiety symptoms are students with learning disabilities (Karande et al., 2023; Nelson & Harwood, 2011) with more boys than girls (Aro et al., 2022; Fisher et al., 1996; Fong & Soni, 2022; Shamionov et al., 2022).

Willcutt and Pennington's (2000) study of twins, one of whom had learning difficulties and one of whom did not, confirmed that children with learning difficulties have higher rates of anxiety (Willcutt & Pennington, 2000).

A survey conducted on a sample of 600 students confirmed that anxiety disorders are relatively common in children with learning disabilities. In addition, he emphasised the importance of considering and addressing aspects of mental health, such as stress, in assessment and intervention strategies for children with learning disabilities. Anxiety disorders in children with learning disabilities can affect their learning process by potentially affecting attention, perception, memory or abstraction due to the intense anxiety state. In the same study, a re-evaluation of the sample of children with speech and language disorders was carried out to monitor the persistence or changes in emotional disorders over time in this population of children with speech and language disorders and learning difficulties. The conclusions drawn from the reassessment were the persistence of Emotional Disorders and an increased rate of anxiety disorders compared to baseline. This suggests a continuing association between learning difficulties and emotional disturbances, highlighting the need for ongoing support and intervention for these children. As such, it also underscored the importance of monitoring and addressing emotional well-being in this population to support their overall development and academic success (Cantwell & Baker, 1991).

These findings highlight the complex relationship between learning disabilities and psychosocial disorders. Specifically, children with learning disabilities are more prone to experiencing internal issues such as anxiety, depression, physical complaints and social isolation (Graham &Bellert, 2004; Polychroni et al., 2024)

Anxiety disorder often coexists with depression in students with learning disabilities(Alesi et al., 2014; Maag & Reid, 2006; Yenduri et al., 2023), which further exacerbates their psychosocial challenges (Huang et al., 2021) and reducing their self-esteem (Alesi et al., 2014; Stathopoulou & Karathanasi, 2023). Additionally, research has shown that children with learning disabilities may also experience higher rates of bullying and social rejection, contributing to their psychosocial difficulties and further impacting their overall well-being (Lauffer, 1999; Polychroni et al., 2013). The Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM 5, 2013) notes the possibility of high rates of comorbidity of depression in students with learning disabilities (Mammarella et al., 2016). It is important for educators and professionals working with children with learning disabilities to be aware of the potential impact of psychosocial disorders on a child's academic and social functioning (Shukla K., 2023).

A study of students with learning disabilities who exhibited anxiety disorders and depressive behaviours found that they were more likely to have attention problems as well as other emotional problems such as thinking problems, poor concentration, attention deficit, less activity, lack of interaction, lack of self-confidence, reduced self-worth, sadness, confusion of emotions and emotional distractions (Jennifer & et al, 2006). The results were consistent with research by Handwerk & Marshall (1998).

An additional internal problem that students with learning disabilities face is physical complaints. A study conducted in 1984 revealed the high occurrence of physical ailments among children with learning disabilities. The findings indicated that 54% of the students experienced physical complaints, with fatigue being the most common one(Bastos et al., 2016; Brueggemann Taylor, 2014; Jingree & Finlay, 2013; Margalit & Raviv, 1984). These physical complaints can further impact their academic performance and overall well-being (Sajan & Sunitha, 2018).

The demands of school are high; teachers and professors give students many exercises and assignments, and achieving high grades requires hours of studying. For a student with learning disabilities to meet these demands, they often have to reduce their sleep hours or have poor-quality sleep. This can lead to behavioural and emotional problems in children, including symptoms of anxiety and depression (Sadeh et al., 2014). Many times, anxiety can also hurt the later life of the individual as many students cannot cope and drop out of school or fail to enter higher education (Kessler et al., 1995; Van Ameringen et al., 2003).

EXTERNAL PROBLEMS

Another problem faced by students with learning disabilities is behavioural problems, which contribute to socialisation(Margalit & Raviv, 1984) and attention deficit (Epstein et al., 1984; McConaughy et al., 1994). This behaviour has implications for their relationships with their family and peers. This may result from processing problems, which make it difficult for children with learning disabilities to receive social cues. Children who cannot develop avoidance behaviour, which is a way of defending themselves to avoid the anxiety that social interaction would cause them, resort to aggressive behaviour(Hassan, 2015).

Anger is still an emotion found in students with learning disabilities. Social scientists argue that anger is a result of the frustration that these children feel from the school and social environment (Richardson, 2013). For this reason, many believe that the target of this anger will be teachers and classmates but this is not always the case. Students mainly express their anger when they are in a safe environment and with people they trust, namely their mothers (Sako, 2016).

Researchers in Sweden conducted a study to examine whether people with dyslexia are more likely to exhibit aggressive behaviour and risk future violence compared to people without dyslexia. According to this study, it was shown that people with dyslexia are more likely to display more aggressive behaviour than people without dyslexia. The behaviour could be a result of experiencing angry emotions triggered by psychological discomfort, such as feelings of frustration. Berkowitz argued that the negative experiences one experiences correlate with how one will manage psychological distress. He also asserts that a network exists linking emotions, thoughts, and recollections, which is activated by any one of them. Thus, a student with dyslexia who experiences negative experiences at school and reading failures in everyday life (e.g., subtitles in movies, reading messages, etc.) can be led to psychological distress and activation of the network (Selenius et al., 2011). This may result in an outburst of anger, which is seen as a potential dynamic risk factor for future violence (Douglas & Skeem, 2005).

Executive Functions

Executive functions (EF) are essential for lifelong development, affect physical and mental health, academic performance and social interactions, and develop throughout childhood and adolescence (Anderson, 2002; Qi, 2023). Executive functions are a set of top-down cognitive processes crucial for emotional self-regulation, goal-directed behaviour, and academic success (Horowitz-Kraus et al., 2023; Kerr & Zelazo, 2004). These functions encompass conscious monitoring of responsibilities, supervisory attentional system, decision making and playing a significant role in student achievement during professional training (Drigas & Karyotaki,

2019a; Key-DeLyria& Altmann, 2016; Ramos-Galarza et al., 2023).

The parts of the brain associated with thinking skills that make up executive functions, working memory, inhibitory control, and flexible shifting of attention are located in the prefrontal cortex (Geens, 2022; Ye, 2023). Other brain areas that help support these skills are the parietal cortex, and subcortical structures (amygdala, the main ganglia and hippocampus). The amygdala plays a crucial role in processing emotional information and is implicated in disorders such as anxiety and depression (Olucha-Bordonau et al., 2015). The basal ganglia, including the nucleus accumbens, are involved in behaviour selection and response inhibition, with inputs from limbic structures and the neocortex influencing activity levels (Wilde et al., 2007).
Therefore, the intricate interplay between the amygdala, basal ganglia, and hippocampus is fundamental in shaping executive functions and cognitive processes.

The literature review shows a division of EFs into hot and cold. Cold functions are purely cognitive while warm functions are mainly affective-motor (Drigas & Karyotaki, 2019). Cold functions include problem-solving, planning, attention maintenance, working memory, etc... Warm functions include self-regulation of behaviour, decision-making, emotion regulation, and any cold executive function involving emotional features. The brain areas in which cold EFs take place are dorsolateral (Leshem et al., 2020; Ruiz-Castañeda et al., 2020) and lateral prefrontal cortex(Moriguchi, 2022; Rahimi-Golkhandan, 2015; Salehinejad et al., 2021), anterior prefrontal cortex, inferior frontal cortex, and the subcortical structures of the hippocampus and the basal ganglia. While the warm ones in the medial prefrontal cortex (Peterson & Welsh, 2013; Rusnáková&Rektor, 2012), the external ventral prefrontal cortex (Leshem et al., 2020), and the cingulate cortex (Ardila, 2019; Moreno-López et al., 2012; Moriguchi, 2022), as well as in the subcortical structures of the amygdala (Colautti et al., 2022; Pellizzoni et al., 2021), insula, limbic system(Kuin et al., 2019; Yang et al., 2011), and striatum (Salehinejad et al., 2021; Yang et al., 2011).

Additionally, research suggests that both hot and cool EF can moderate the relationship between temperament and psychological difficulties in middle childhood, emphasizing the importance of investigating these constructs separately (Wilson et al., 2022).

Executive functions are affected by stress as when a person is stressed or overstimulated then activity in the prefrontal lobe and thinking skills are reduced (Blair, 2017). Some other factors that contribute negatively to executive functions are (Blair et al., 2011; Hackman & Farah, 2009):

Biological, as it is shown that premature childbirth without medical complications can also lead to dysfunctional executive functions and lower

academic achievement(Campanholo et al., 2017; Likhitweerawong et al., 2023; Walshe et al., 2017).

Environmental, studies have found that low maternal education, permissive parenting styles and excessive screen exposure have been associated with impaired executive functions in preschool children(Horowitz-Kraus et al., 2023).

Socioeconomic, as lower levels of education and income have been associated with reduced executive functions with age(Dunn & Kronenberger, 2016).

EFs are very important, if a person has problems with EFs this can result in not being able to sustain attention, having difficulty planning an activity, memory deficits as well and learning difficulties (Bull et al., 2008). Studies have highlighted a correlation between EFs and intelligence in individuals with intellectual disabilities, with working memory being a key component strongly linked to general, fluid, and crystallised forms of intelligence (Jamil & Abu-Abeeleh, 2022). Furthermore, differences in EFs have been observed among students with autism spectrum disorder, mild intellectual disabilities, and learning difficulties, emphasising the role of EFs in distinguishing between these groups (Sharfi et al., 2022). Students with learning disabilities struggle to comprehend and handle information during instruction and encounter challenges sustaining attention on assigned tasks (Alloway et al., 2009; Doulou & Drigas, 2022; Gathercole & Alloway, 2006; Takacs & Kassai, 2019; Zelazo, 2020; Zografou & Drigas, 2022). Additionally, high levels of anxiety experienced by students with learning disabilities can negatively impact cognitive and academic performance, underscoring the importance of addressing emotional regulation alongside EFs (Zografou & Drigas, 2022).

The only way to address this is early intervention. There are video games (Blair, 2017; Buelow et al., 2015; Karyotaki & Drigas, 2015) which may have positive effects on certain executive functions or E-learning mobile apps such as "TangiPlan" (Doulou et al., 2022), or computer games which focused on EF training but also improved students' mathematical performance (Holmes et al., 2009) or the use of robots (Di Lieto et al., 2020) or the use of STEM (Xie, 2020).

EFs are not only related to cognitive skills but also to metacognitive and social skills(Drigas & Karyotaki, 2019; Zelazo et al., 2003). The growth of executive function skills, such as control, memory, and adaptability, has been associated with metacognitive capabilities, especially in young children entering formal education (Marulis& Nelson, 2021). Moreover, research has emphasised the influence of direct instruction on metacognitive strategies in improving self-perception and cognitive understanding. This underscores the significance of incorporating metacognitive interventions in academic environments (Kälin&Roebers, 2022).

Self-regulation of behaviour is closely linked to executive function skills, as well as cognitive flexibility skills, as the child adopts appropriate behaviour based on the situation (McClelland et al., 2021). Additionally, a study on disadvantaged four-year-olds in rural Pakistan found that directly assessed executive functions were significantly related to assessor observations of inhibitory control and positive affect/engagement, highlighting the importance of considering both EF tasks and self-regulation behaviours in understanding early childhood development (Cumming et al., 2022). Moreover, EF and effortful control (EC) are overlapping and highly similar constructs, with significant correlations between measures of EF and EC in preschoolers (Schmidt et al., 2022). Therefore, EF plays a crucial role in supporting self-regulation processes, highlighting the interconnectedness of these cognitive functions in promoting adaptive behaviours and successful coping strategies in various contexts of stress and adversity (Cumming et al., 2022).

Self-Regulation

Self-regulation is important for children's development (Russell and Russell 2020). At young ages, it can be divided into self-regulation of emotions, cognitions and behavioural outcomes, but their comorbidity is also observed (Blair and Raver 2015a; McClelland et al. 2021). It involves self-reflection, goal-setting, planning, monitoring, and evaluating one's actions, thoughts, and feelings, making it a proactive and conscious activity crucial for personal development and learning (Strauman& Hariri, 2023). In addition, it is associated with many developmental outcomes (e.g., social, emotional, affective, and academic) (Backer-Grøndahl, Nærde, and Idsoe 2019; Nigg 2017), school readiness (Blair and Raver 2015b; Pan et al. 2019), and health (e.g., obesity) (Backer-Grøndahl et al. 2019; Miller et al. 2016).

Self-regulation plays a crucial role in the context of learning difficulties. A study involving students with learning disabilities and difficulties in reading comprehension demonstrated that they exhibit lower proficiency in achieving goals and employing effective self-regulation strategies. They frequently lean towards performance-avoidance goals and employ surface-level strategies instead of more meaningful, motivational, monitoring, and persistence methods. As a result, their self-regulation profile is less direct compared to their peers without such difficulties (Kampylafka et al., 2023). Academic resilience, which involves adapting positively to academic pressures, correlates positively with self-regulated learning. Students with learning difficulties often demonstrate medium levels of self-regulated learning, with differences observed based on gender, difficulty categories, and grade levels (Ziadat&Sakarneh, 2022). Procrastination, a form of self-regulation failure, is linked to impaired learning from errors and punishments, potentially contributing to the persistence of procrastination and other self-regulation disorders (Przetacka et al., 2022). Additionally, the lack of self-regulated skills

among students due to digital distractions and mind wandering can hinder their online learning experiences, leading to low performance and increased dropout rates (Anthonysamy, 2022).

Self-regulation skills in special education can be strengthened through various intervention programs. For example, the Program for Enhancing Academic and Behavioral Learning Skills has been shown to significantly improve cognitive skills and academic performance among students with learning difficulties (Kaushik & Jena, 2021). Video self-monitoring interventions are also effective, aiming to enhance reading accuracy and self-monitoring skills in students with reading and self-regulation difficulties(Hautakangas et al., 2022). Additionally, biofeedback training programs focusing on controlling heart rate variability through slow-paced breathing have demonstrated significant improvements in self-regulation among primary education students(Payne, 2022). Interventions based on the social-cognitive perspective of self-regulated learning have also shown positive effects on these essential skills(Aritzeta et al., 2022). By incorporating diverse intervention strategies, special education programs can effectively enhance self-regulation skills in students with varying needs and challenges. Addressing this multifaceted aspect is crucial for supporting student learning as it is associated with executive function skills, particularly for those who experience learning difficulties or disabilities.

Self-esteem has been extensively studied, and several definitions aim to describe it. The simplest definition can be found in Webster's dictionary, which defines self-esteem as the satisfaction one feels with oneself. It encompasses all aspects of the self, including specific areas such as social status, race, physical characteristics, occupation or school performance. Self-esteem is closely linked to self-image and self-consciousness (Abdel-Khalek, 2016). High levels of self-esteem are essential for developing a sense of success and fostering optimism (Orth & Robins, 2022; Wani & Dar, 2017). People with high self-esteem are less likely to experience mental health problems such as depression and anxiety(Wagner et al., 2015). They also exhibit better self-regulated behaviour. On the other hand, individuals with low self-esteem often face feelings of inferiority and worthlessness (Kałużna-Wielobób, 2017; Lamberson & Wester, 2018; Rizwan & Ahmad, 2015). Additionally, they may display emotional instability, depression, and aggression (Barbalat et al., 2022; Keane & Loades, 2017; Marshall et al., 2015), along with negative attitudes towards people and situations (Orth & Robins, 2022).

Existing research consistently demonstrates the profound influence of self-esteem on the well-being and academic performance of students with learning disabilities. Studies have revealed that this population often exhibits lower levels of self-esteem (Lorenson, 1990; Polychroni et al., 2013; Touloupis, 2024), which can contribute to increased susceptibility to psychological distress (Yakut & Akgul, 2023). Moreover, family communication patterns and parenting styles have been identified as significant factors in shaping the self-esteem of students with learning disabilities, with parenting styles being a stronger predictor of self-esteem levels in this population (Homayoon & Almasi, 2021). Additionally, family functioning, including dimensions like communication, cohesion, conflict, and social/recreational orientation, plays a significant role in shaping the self-concept of children, both with and without learning disabilities. This underscores the significant impact of family dynamics on one's self-perception (Yawn et al., 2013). Moreover, parents of children with learning disabilities can significantly impact their self-esteem by understanding and adjusting their attributional styles. This is especially true in terms of external and personal control, highlighting the crucial role of parental attitudes in shaping the self-esteem of children with dyslexia (Yawn et al., 2013). Consequently, cultivating and promoting positive self-esteem among students with learning disabilities is essential for their overall well-being and academic success.

Self-Image

An individual's self-image encompasses their perceptions of physical appearance, intelligence, and personality traits. Research has examined self-image across various contexts, from high school students exhibiting negative self-images like low self-esteem to the impact of self-image on academic performance in undergraduate students (Naz et al., 2019). Multiple factors influence students' self-image, including their family background, academic achievements, body image perception, and professional self-concept.

The family environment, relationships, and dynamics play a crucial role in shaping students' self-esteem (Rohde, 2023). Academic performance, as measured by school grades, can significantly impact how students perceive themselves, particularly in terms of intelligence (Yahaya et al., 2021). Additionally, body image perception, influenced by media, peers, society, culture, and family, affects students' self-image (Badiyepeymaiejahromi et al., 2020; Tenkorang& Okyere, 2022). Professional self-concept, developed during academic years, is another important factor influencing students' self-image, shaped by personal, educational, environmental, and social factors. Studies have revealed that students with learning challenges often exhibit discrepancies in their self-image and self-esteem compared to their peers without such difficulties(Einat, 2017). Furthermore, the emotional impact of fluctuating between success and failure due to learning gaps can have critical implications on the overall self-perception of individuals with learning disabilities, including those with a high intellectual capacity (Vrakas et al., 2022). Understanding these diverse

5

influences is essential for supporting students and promoting positive self-image and self-esteem.

Conclusion

Extensive research on learning disabilities and psychosocial disorders has revealed the multifaceted challenges faced by affected students. The interconnection between anxiety, depression, and other emotional and behavioural issues underscores the need for comprehensive support and intervention strategies. Early intervention is crucial, employing methods such as video games, e-learning mobile apps, robots, or STEM-oriented approaches designed to improve executive functions and social metacognitive capabilities, particularly for young children entering formal education(Brainin et al., 2021; Dorouka et al., 2020; Drakatos & Drigas, 2024; Drigas et al., 2020; Galitskaya & Drigas, 2019, 2020, 2021, 2023; Julià&Antolì, 2018; Kefalis & Drigas, 2019; Lytra & Drigas, 2021; Michalopoulou et al., 2023; Mitsea et al., 2023a, 2023b, 2024; Sideraki & Drigas, 2023; Sisman et al., 2021; Stathopoulou et al., 2018; Stathopoulou & Karathanasi, 2023; Wai et al., 2010; Zografou & Drigas, 2022).

External factors, including behavioural problems and socialisation difficulties, further compound the experiences of these students, significantly impacting their relationships with family and peers. This emphasises the importance of creating supportive and understanding environments in both educational and social settings.

Understanding the diverse emotional and behavioural challenges encountered by students with learning disabilities is essential for educators, parents, and professionals in designing effective support systems. Acknowledging the complex nature of these issues, it is increasingly important to provide tailored support addressing these students' academic and emotional well-being. Addressing the needs of students with learning disabilities and psychosocial disorders requires a holistic approach encompassing academic support, emotional well-being, and social skills development (Ennis, 2015).

Additionally, students with learning disabilities may struggle to activate relevant knowledge or develop adequate background understanding, while also experiencing emotional challenges, such as anger issues, often arising from feelings of frustration and negative experiences in their school and social environments (Graham &Bellert, 2004; Zambo & Brem, 2004).

References

[1] Abdel-Khalek, A. M. (2016). Introduction to the psychology of self-esteem. In FRANKLIN HOLLOWAY (Ed.), Self-esteem: perspectives, influences, and improvement strategies (pp. 1–23). Nova Science Publishers, Inc.

[2] Alesi, M., Rappo, G., & Pepi, A. (2014a). Depression, anxiety at school and self-esteem in children with learning disabilities. Journal of Psychological Abnormalities in Children, 3(3), 0.

[3] Alloway, T. P., Gathercole, S. E., Kirkwood, H., & Elliott, J. (2009). The cognitive and behavioral characteristics of children with low working memory. Child Development, 80(2), 606–621.

[4] Anderson, P. (2002). Assessment and development of executive function (EF) during childhood. Child Neuropsychology, 8(2), 71–82.

[5] Anthonysamy, L. (2022). Formulation of self-regulated learning strategies framework for digital learning for lifelong learning. Asian Journal of Research in Education and Social Sciences, 4(1), 24–32.

[6] Ardila, A. (2019). Executive functions brain functional system. Dysexecutive Syndromes: Clinical and Experimental Perspectives, 29–41.

[7] Aritzeta, A., Aranberri-Ruiz, A., Soroa, G., Mindeguia, R., &Olarza, A. (2022). Emotional self-regulation in primary education: A heart rate-variability biofeedback intervention programme. International Journal of Environmental Research and Public Health, 19(9), 5475.

[8] Aro, T., Eklund, K., Eloranta, A.-K., Ahonen, T., & Rescorla, L. (2022). Learning disabilities elevate children's risk for behavioral-emotional problems: Differences between LD types, genders, and contexts. Journal of Learning Disabilities, 55(6), 465–481.

[9] Backenson, E. M., Holland, S. C., Kubas, H. A., Fitzer, K. R., Wilcox, G., Carmichael, J. A., Fraccaro, R. L., Smith, A. D., Macoun, S. J., & Harrison, G. L. (2015). Psychosocial and adaptive deficits associated with learning disability subtypes. Journal of Learning Disabilities, 48(5), 511–522.

[10] Badiyepeymaiejahromi, Z., Yektatalab, S., Momennasab, M., & Mehrabi, M. (2020). Factors affecting nursing students' professional self-concept in Iran: a qualitative study. ProfessioniInfermieristiche, 73(2).

[11] Barbalat, G., Plasse, J., Gauthier, E., Verdoux, H., Quiles, C., Dubreucq, J., Legros-Lafarge, E., Jaafari, N., Massoubre, C., & Guillard-Bouhet, N. (2022). The central role of self-esteem in the quality of life of patients with mental disorders. Scientific Reports, 12(1), 7852.

[12] Barkauskiene, R., &Bieliauskaite, R. (2002). [Behavioral and emotional problems of children with learning disabilities]. Medicina (Kaunas, Lithuania), 38(4), 439—443. http://europepmc.org/abstract/MED/12474794

[13] Bastos, J. A., Cecato, A. M. T., Martins, M. R. I., Grecca, K. R. R., & Pierini, R. (2016). The prevalence of developmental dyscalculia in Brazilian public school system. Arquivos de Neuro-Psiquiatria, 74(03), 201–206.

[14] Blair, C. (2017). Educating executive function. Wiley Interdisciplinary Reviews: Cognitive Science, 8(1–2), e1403.

[15] Blair, C., Granger, D. A., Willoughby, M., Mills-Koonce, R., Cox, M., Greenberg, M. T., Kivlighan, K. T., Fortunato, C. K., & Investigators, F. L. P. (2011). Salivary cortisol mediates effects of poverty and parenting on executive functions in

early childhood. Child Development, 82(6), 1970–1984.

[16] Bosquet, M., & Egeland, B. (2006). The development and maintenance of anxiety symptoms from infancy through adolescence in a longitudinal sample. Development and Psychopathology, 18(2), 517–550.

[17] Brainin, E., Shamir, A., & Eden, S. (2021). Robot programming intervention for promoting spatial relations, mental rotation and visual memory of kindergarten children. Journal of Research on Technology in Education, 1–14.

[18] Brueggemann Taylor, A. E. (2014). Diagnostic assessment of learning disabilities in childhood: Bridging the gap between research and practice.

[19] Buelow, M. T., Okdie, B. M., & Cooper, A. B. (2015). The influence of video games on executive functions in college students. Computers in Human Behavior, 45, 228–234.

[20] Bull, R., Espy, K. A., & Wiebe, S. A. (2008). Short-term memory, working memory, and executive functioning in preschoolers: Longitudinal predictors of mathematical achievement at age 7 years. Developmental Neuropsychology, 33(3), 205–228.

[21] Campanholo, K. R., Boa, I. N. F., Hodroj, F. C. da S. A., Guerra, G. R. B., Miotto, E. C., & Lucia, M. C. S. de. (2017). Impact of sociodemographic variables on executive functions. Dementia &Neuropsychologia, 11, 62–68.

[22] Cantwell, D. P., & Baker, L. (1991). Association between attention deficit-hyperactivity disorder and learning disorders. Journal of Learning Disabilities, 24(2), 88–95.

[23] Colautti, L., Antonietti, A., & Iannello, P. (2022). Executive functions in decision making under ambiguity and risk in healthy adults: A scoping review adopting the hot and cold executive functions perspective. Brain Sciences, 12(10), 1335.

[24] Cumming, M. M., Zelazo, P. D., Smith, S. W., & Flores, H. R. (2022). Self-regulation and executive function: The foundation for student success. In Handbook of Special Education Research, Volume I (pp. 285–298). Routledge.

[25] Di Lieto, M. C., Castro, E., Pecini, C., Inguaggiato, E., Cecchi, F., Dario, P., Cioni, G., &Sgandurra, G. (2020). Improving executive functions at school in children with special needs by educational robotics. Frontiers in Psychology, 10, 2813.

[26] Dorouka, P., Papadakis, S., &Kalogiannakis, M. (2020). Tablets and apps for promoting robotics, mathematics, STEM education and literacy in early childhood education. In Int. J. Mobile Learning and Organisation (Vol. 14, Issue 2).

[27] Douglas, K. S., & Skeem, J. L. (2005). Violence risk assessment: getting specific about being dynamic. Psychology, Public Policy, and Law, 11(3), 347.

[28] Doulou, A., & Drigas, A. (2022). Behavioral Problems in schools: A theoretical overview and the role of ICTs. Technium Soc. Sci. J., 29, 54.

[29] Doulou, A., Drigas, A., & Skianis, C. (2022). Mobile applications as intervention tools for children with ADHD for a sustainable education. Technium Sustainability, 2(4), 44–62.

[30] Drakatos, N., & Drigas, A. (2024). The impact of STEAM education using robotics on the executive function of typical and ADHD students along with developmental exploration. Brazilian Journal of Science, 3(2), 113–122.

[31] Drigas, A., Dede, D. E., & Dedes, S. (2020). Mobile and other applications for mental imagery to improve learning disabilities and mental health. International Journal of Computer Science Issues (IJCSI), 17(4), 18–23.

[32] Drigas, A., & Karyotaki, M. (2019). Executive Functioning and Problem Solving: A Bidirectional Relation. Int. J. Eng. Pedagog., 9(3), 76–98.

[33] Dunn, D. W., & Kronenberger, W. G. (2016). Attention, Executive Function, and Attention Deficit Hyperactivity Disorder. Neuropsychiatric Symptoms of Epilepsy, 213–234.

[34] Einat, A. (2017). The perceived impact of unstable gaps between academic ability and performance on the self-image of students with learning disabilities. Learning Disabilities: A Multidisciplinary Journal, 22(1).

[35] Epstein, M. H., Cullinan, D., & Nieminen, G. (1984). Social behavior problems of learning disabled and normal girls. Journal of Learning Disabilities, 17(10), 609–611.

[36] Fisher, B. L., Allen, R., & Kose, G. (1996). The relationship between anxiety and problem-solving skills in children with and without learning disabilities. Journal of Learning Disabilities, 29(4), 439–446.

[37] Fong, H., & Soni, A. (2022). A systematic review on test anxiety in children and young people with learning difficulties. Support for Learning, 37(1), 21–43.

[38] Galitskaya, V., & Drigas, A. S. (2023). Mobiles & ICT Based Interventions for Learning Difficulties in Geometry. International Journal of Engineering Pedagogy, 13(4).

[39] Galitskaya, V., & Drigas, A. (2021). The importance of working memory in children with Dyscalculia and Ageometria. Scientific Electronic Archives, 14(10).

[40] Galitskaya, V., & Drigas, A. (2020). Special education: Teaching geometry with ICTs. International Journal of Emerging Technologies in Learning (IJET), 15(6), 173–182.

[41] Galitskaya, V., & Drigas, A. (2019). ICTs and Geometry. Int. J. Eng. Pedagog., 9(5), 103–111.

Gathercole, S. E., & Alloway, T. P. (2006). Practitioner review: Short-term and working memory impairments in neurodevelopmental disorders: Diagnosis and remedial support. Journal of Child Psychology and Psychiatry, 47(1), 4–15.

[42] Geens, W. (2022). Skills relating to executive function. In Nurturing Self-Regulation in Early Childhood (pp. 97–116). Routledge.

[43] Graham, L., &Bellert, A. (2004). Difficulties in reading comprehension for students with learning disabilities. In Learning about learning disabilities (pp. 251–279). Elsevier.

[44] Hackman, D. A., & Farah, M. J. (2009). Socioeconomic status and the developing brain. Trends in Cognitive Sciences, 13(2), 65–73.

[45] Hassan, A. E. H. (2015). Emotional and behavioral problems of children with learning disabilities. Journal of Educational Policy and Entrepreneurial Research, 2(10), 66–74.

[46] Hautakangas, M., Kumpulainen, K., & Uusitalo, L. (2022). Children developing self-regulation skills in a Kids' Skills intervention programme in Finnish Early Childhood Education and Care. Early Child Development and Care, 192(10), 1626–1642.

[47] Holmes, J., Gathercole, S. E., & Dunning, D. L. (2009). Adaptive training leads to sustained enhancement of poor working memory in children. Developmental Science, 12(4), F9–F15.

[48] Homayoon, M. N., & Almasi, M. (2021). The Role of Family Communication Patterns and Parenting Styles in the Self-Esteem of Students with Learning Disabilities. Journal of Family Relations Studies, 1(2), 17–27.

[49] Horowitz-Kraus, T., Randell, K., & Morag, I. (2023a). Neurobiological perspective on the development of executive functions. Acta Paediatrica, 112(9), 1860–1864.

[50] Huang, J., Saleh, S., & Liu, Y. (2021). A review on artificial intelligence in education. Academic Journal of Interdisciplinary Studies, 10(206).

[51] Jamil, A.-S., & Abu-Abeeleh, O. (2022). Executive Functions that Distinguish Students with Autism Spectrum Disorder, Mild Intellectual Disability and Learning Disabilities. Dirasat: Educational Sciences, 49(1), 131–146.

[52] Jingree, T., & Finlay, W. M. L. (2013). Expressions of dissatisfaction and complaint by people with learning disabilities: A discourse analytic study. British Journal of Social Psychology, 52(2), 255–272.

[53] Julià, C., &Antolì, J. Ò. (2018). Enhancing spatial ability and mechanical reasoning through a STEM course. International Journal of Technology and Design Education, 28(4), 957–983.

[54] Kälin, S., &Roebers, C. M. (2022). Longitudinal associations between executive functions and metacognitive monitoring in 5-to 8-year-olds. Metacognition and Learning, 17(3), 1079–1095.

[55] Kałużna-Wielobób, A. (2017). The community feeling versus anxiety, self-esteem and well-being– introductory research. Polish Psychological Bulletin.

[56] Kampylafka, C., Polychroni, F., & Antoniou, A.-S. (2023). Primary school students with reading comprehension difficulties and students with learning disabilities: Exploring their goal orientations, classroom goal structures, and self-regulated learning strategies. Behavioral Sciences, 13(2), 78.

[57] Karande, S., Gogtay, N. J., Shaikh, N., Sholapurwala, R., More, T., & Meshram, P. (2023). Self-perceived anxiety symptoms in school students with borderline intellectual functioning: A cross-sectional questionnaire-based study in Mumbai, Maharashtra, India. Journal of Postgraduate Medicine, 69(2), 89–96.

[58] Karyotaki, M., & Drigas, A. (2015). Online and other ICT Applications for Cognitive Training and Assessment. International Journal of Online Engineering, 11(2).

[59] Kaushik, P., & Jena, S. P. K. (2021). Self-Regulation learning strategies and academic performance in students with learning difficulty. International Journal of Behavioral Sciences, 14(4), 172–177.

[60] Keane, L., & Loades, M. (2017). Low self-esteem and internalizing disorders in young people–a systematic review. Child and Adolescent Mental Health, 22(1), 4–15.

[61] Kefalis, C., & Drigas, A. (2019). Web Based and Online Applications in STEM Education. International Journal of Engineering Pedagogy, 9(4).

[62] Kerr, A., & Zelazo, P. D. (2004). Development of "hot" executive function: The children's gambling task. Brain and Cognition, 55(1), 148–157.

[63] Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Archives of General Psychiatry, 62(6), 593–602.

[64] Kessler, R. C., Foster, C. L., Saunders, W. B., & Stang, P. E. (1995). Social consequences of psychiatric disorders, I: Educational attainment. American Journal of Psychiatry, 152(7), 1026–1032.

[65] Key-DeLyria, S. E., & Altmann, L. J. P. (2016). Executive function and ambiguous sentence comprehension. American Journal of Speech-Language Pathology, 25(2), 252–267.

[66] Kuin, N. C., de Vries, J., Scherder, E. J. A., van Pelt, J., &Masthoff, E. D. M. (2019). Cool and hot executive functions in relation to aggression and testosterone/cortisol ratios in male prisoners. Annals of Behavioral Neuroscience, 2(1), 206–222.

[67] Lamberson, K. A., & Wester, K. L. (2018). Feelings of inferiority: A first attempt to define the construct empirically. The Journal of Individual Psychology, 74(2), 172–187.

[68] Lauffer, K. A. (1999). Accommodating students with specific writing disabilities. Journalism & Mass Communication Educator, 54(4), 29–46.

[69] Leshem, R., De Fano, A., & Ben-Soussan, T. D. (2020). The implications of motor and cognitive inhibition for hot and cool executive functions: The case of quadrato motor training. Frontiers in Psychology, 11, 524979.

[70] Likhitweerawong, N., Khorana, J., Boonchooduang, N., Phinyo, P., Patumanond, J., &Louthrenoo, O. (2023). Associated biological and environmental factors of impaired executive function in preschool-aged children: A population-based study. Infant and Child Development, 32(3), e2404.

[71] Lorenson, L. S. (1990). A Comparison of Academic and Nonacademic Self-Concept in Elementary Level Learning Disabled and Nonlearning Disabled Students.

[72] Lytra, N., & Drigas, A. (2021). STEAM education-metacognition–Specific Learning Disabilities. Scientific Electronic Archives, 14(10).

[73] Maag, J. W., & Reid, R. (2006). Depression among students with learning disabilities: Assessing the risk. Journal of Learning Disabilities, 39(1), 3–10.

[74] Mammarella, I. C., Ghisi, M., Bomba, M., Bottesi, G., Caviola, S., Broggi, F., & Nacinovich, R. (2016). Anxiety and depression in children with nonverbal learning disabilities, reading disabilities, or typical development. Journal of Learning Disabilities, 49(2), 130–139.

[75] Margalit, M., & Raviv, A. (1984). LDs' expressions of anxiety in terms of minor somatic complaints. Journal of Learning Disabilities, 17(4), 226–228.

[76] Marshall, S. L., Parker, P. D., Ciarrochi, J., Sahdra, B., Jackson, C. J., & Heaven, P. C. L. (2015). Self-compassion protects against the negative effects of low self-esteem: A longitudinal study in a large adolescent sample. Personality and Individual Differences, 74, 116–121.

[77] Marulis, L. M., & Nelson, L. J. (2021). Metacognitive processes and associations to executive function and motivation during a problem-solving task in 3–5 year olds. Metacognition and Learning, 16(1), 207–231.

[78] McClelland, M. M., Gonzales, C. R., Cameron, C. E., Geldhof, G. J., Bowles, R. P., Nancarrow, A. F., Merculief, A., & Tracy, A. (2021). The Head-Toes-Knees-Shoulders revised: Links to academic outcomes and measures of EF in young children. Frontiers in Psychology, 12, 721846.

[79] McConaughy, S. H., Mattison, R. E., & Peterson, R. L. (1994). Behavioral/emotional problems of children with serious emotional disturbances and learning disabilities. School Psychology Review, 23(1), 81–98.

[80] Michalopoulou, V., Sarantiti, M., Chatzimbey, C., & Drigas, A. (2023). The effects of augmented reality and video games on mental skills of students with learning disabilities. World Journal of Advanced Engineering Technology and Sciences, 9(2), 324–337.

[81] Mitsea, E., Drigas, A., & Skianis, C. (2023a). Digitally Assisted Mindfulness in Training Self-Regulation Skills for Sustainable Mental Health: A Systematic Review. Behavioral Sciences, 13(12), 1008.

[82] Mitsea, E., Drigas, A., & Skianis, C. (2023b). Virtual Reality Mindfulness for Meta-Competence Training among People with Different Mental Disorders: A Systematic Review. Psychiatry International, 4(4), 324–353.

[83] Mitsea, E., Drigas, A., & Skianis, C. (2024). Artificial Intelligence, Immersive Technologies, and Neurotechnologies in Breathing Interventions for Mental and Emotional Health: A Systematic Review. Electronics, 13(12), 2253.

[84] Moreno-López, L., Stamatakis, E. A., Fernández-Serrano, M. J., Gómez-Rio, M., Rodríguez-Fernández, A., Pérez-García, M., & Verdejo-García, A. (2012). Neural correlates of hot and cold executive functions in polysubstance addiction: association between neuropsychological performance and resting brain metabolism as measured by positron emission tomography. Psychiatry Research: Neuroimaging, 203(2–3), 214–221.

[85] Moriguchi, Y. (2022). Relationship between cool and hot executive function in young children: A near-infrared spectroscopy study. Developmental Science, 25(2), e13165.

[86] Naz, R., Abid, F., Naz, T., Nayem, S., & Aleem, S. A. (2019). Self-Image and Its Impact on Academic Performance of Undergraduate Medical Students in Karachi. Annals of Jinnah Sindh Medical University, 5(1), 31–34.

[87] Nelson, J. M., & Harwood, H. (2011). Learning disabilities and anxiety: A meta-analysis. Journal of Learning Disabilities, 44(1), 3–17.

[88] Olucha-Bordonau, F. E., Fortes-Marco, L., Otero-García, M., Lanuza, E., & Martínez-García, F. (2015). Amygdala: structure and function. In The rat nervous system (pp. 441–490). Elsevier.

[89] Orth, U., & Robins, R. W. (2022). Is high self-esteem beneficial? Revisiting a classic question. American Psychologist, 77(1), 5.

[90] Payne, M. A. (2022). Examining the Impact of a Self-Awareness Intervention on the Reading Accuracy and Self-Monitoring Skills of Students with Reading Difficulties. Boise State University.

[91] Pellizzoni, S., Fontana, M., & Passolunghi, M. C. (2021). Exploring the effect of cool and hot EFs training in four-year-old children. European Journal of Developmental Psychology, 18(5), 731–746.

[92] Peterson, E., & Welsh, M. C. (2013). The development of hot and cool executive functions in childhood and adolescence: Are we getting warmer? Handbook of Executive Functioning, 45–65.

[93] Polychroni, F., Antoniou, A. S., &Kotroni, C. (2013). Social, emotional and motivational aspects of learning disabilities: challenges and responses. Education, Family and Child & Adolescent Health; Antoniou, A.-S., Kirkcaldy, BD, Eds, 93–119.

[94] Polychroni, F., Antoniou, A.-S., Kofa, O., &Charitaki, G. (2024). Reading self-concept, trait emotional intelligence and anxiety of primary school children with dyslexia. Frontiers in Education, 9, 1371627.

[95] Przetacka, J., Droździel, D., Michałowski, J. M., & Wypych, M. (2022). Self-regulation and learning from failures: Probabilistic reversal learning task reveals lower flexibility persisting after punishment in procrastinators. Journal of Experimental Psychology: General, 151(8), 1942.

[96] Qi, J. (2023). The Importance and Training of Executive Functions among Children and Children with Autism Spectrum Disorder. Journal of Education, Humanities and Social Sciences, 8, 1886–1891.

[97] Rahimi-Golkhandan, S. (2015). Hot executive function in children with developmental coordination disorder.

[98] Ramos-Galarza, C., Ramos, V., Del Valle, M., Lepe-Martínez, N., Cruz-Cárdenas, J., Acosta-Rodas, P., & Bolaños-Pasquel, M. (2023). Executive

functions scale for university students: UEF-1. Frontiers in Psychology, 14, 1192555.

[99] Richardson, T. (2013). Aggressive behaviour in adults with learning disabilities. Clinical Psychology and People With Learning Disabilities, 11(1 & 2)), 63–64.

[100] Rizwan, M., & Ahmad, R. (2015). Self-esteem deficits among psychiatric patients. Sage Open, 5(2), 2158244015581649.

[101] Rohde, N. (2023). It's Understandable If It Destroys You, Right?—Grades, Students' Self-Images, and Quantification. Journal of Contemporary Ethnography, 52(5), 607–632.

[102] Ruiz-Castañeda, P., Santiago-Molina, E., Aguirre-Loaiza, H., & Daza González, M. T. (2020). "Cool" and "Hot" executive functions in patients with a predominance of negative schizophrenic symptoms. Frontiers in Psychology, 11, 571271.

[103] Rusnáková, Š., &Rektor, I. (2012). The neurocognitive networks of the executive functions. Advances in Clinical Neurophysiology; Croatia: InTech, 161–170.

[104] Sadeh, A., Tikotzky, L., & Kahn, M. (2014). Sleep in infancy and childhood: implications for emotional and behavioral difficulties in adolescence and beyond. Current Opinion in Psychiatry, 27(6), 453–459.

[105] Sajan, D. K. S., & Sunitha, M. S. (2018). Development of a Model for the TPACK for Children with Learning Disability [J]. Journal of Trend in Scientific Research and Development, 2(2).

[106] Sako, E. (2016). The emotional and social effects of dyslexia. European Journal of Interdisciplinary Studies, 2(2), 175–183.

[107] Salehinejad, M. A., Ghanavati, E., Rashid, M. H. A., & Nitsche, M. A. (2021). Hot and cold executive functions in the brain: A prefrontal-cingular network. Brain and Neuroscience Advances, 5, 23982128211007770.

[108] Schmidt, H., Daseking, M., Gawrilow, C., Karbach, J., & Kerner auch Koerner, J. (2022). Self-regulation in preschool: Are executive function and effortful control overlapping constructs? Developmental Science, 25(6), e13272.

[109] Selenius, H., Hellström, Å., &Belfrage, H. (2011). Aggression and risk of future violence in forensic psychiatric patients with and without dyslexia. Dyslexia, 17(2), 201–206.

[110] Shamionov, R. M., Grigorieva, M. V, Grinina, E. S., &Sozonnik, A. V. (2022). Characteristics of school well-being and anxiety in adolescents with disabilities. The Education and Science Journal, 24(10), 165–199.

[111] Sharfi, K., Rosenblum, S., & Meyer, S. (2022). Relationships between executive functions and sensory patterns among adults with specific learning disabilities as reflected in their daily functioning. Plos One, 17(4), e0266385.

[112] Shukla K. (2023). Psychological Impact of Learning Disabilities in among Adolescence. International Journal For Multidisciplinary Research, 5(3), 1–5.

[113] Sideraki, A., & Drigas, A. (2023). The role of cortisol and microbiome in the anxiety of people with ASD and the use of ICTs for regulation. World Journal of Biology Pharmacy and Health Sciences, 14(3), 137–148.

[114] Sisman, B., Kucuk, S., & Yaman, Y. (2021). The effects of robotics training on children's spatial ability and attitude toward STEM. International Journal of Social Robotics, 13(2), 379–389.

[115] Sofologi, M., Kougioumtzis, G. A., Efstratopoulou, M., Skoura, E., Sagia, S., Karvela, S., Salli, P. M., Makri, E., &Bonti, E. (2022). Specific Learning Disabilities and Psychosocial Difficulties in Children. In Advising Preservice Teachers Through Narratives from Students with Disabilities (pp. 31–54). IGI Global.

[116] Stathopoulou, A., Karabatzaki, Z., Kokkalia, G., Dimitriou, E., Loukeri, P. I., Economou, A., & Drigas, A. (2018). Mobile Assessment Procedures for Mental Health and Literacy Skills in Education. International Journal of Interactive Mobile Technologies, 12(3).

[117] Stathopoulou, A., & Karathanasi, A. (2023). Students with learning disabilities' mental health Enhancement: The relationship of learning disabilities and emotional difficulties, and the role of ICTs. GSC Advanced Research and Reviews, 16(1), 129–138.

[118] Strauman, T. J., & Hariri, A. R. (2023). Revising a Self-Regulation Phenotype for Depression Through Individual Differences in Macroscale Brain Organization. Current Directions in Psychological Science, 32(4), 267–275.

[119] Takacs, Z. K., & Kassai, R. (2019). The efficacy of different interventions to foster children's executive function skills: A series of meta-analyses. Psychological Bulletin, 145(7), 653.

[120] Tenkorang, S., & Okyere, C. O. (2022). Factors Influencing Body Image Perception of University Students in Ghana. Technium Soc. Sci. J., 27, 492.

[121] Touloupis, T. (2024). Facebook use and cyberbullying by students with learning disabilities: the role of self-esteem and loneliness. Psychological Reports, 127(3), 1237–1270.

[122] Van Ameringen, M., Mancini, C., &Farvolden, P. (2003). The impact of anxiety disorders on educational achievement. Journal of Anxiety Disorders, 17(5), 561–571.

[123] Vrakas, G., Giannouli, V., & Dimitrios, S. (2022). Relation between self-concept-self-esteem of high school students with learning difficulties and participation in bullying. European Journal of Special Education Research, 8(4).

[124] Wagner, J., Hoppmann, C., Ram, N., &Gerstorf, D. (2015). Self-esteem is relatively stable late in life: the role of resources in the health, self-regulation, and social domains. Developmental Psychology, 51(1), 136.

[125] Wai, J., Lubinski, D., Benbow, C. P., & Steiger, J. H. (2010). Accomplishment in science, technology, engineering, and mathematics (STEM) and its relation to STEM educational dose: A 25-

year longitudinal study. Journal of Educational Psychology, 102(4), 860.

[126] Walshe, E. A., Ward McIntosh, C., Romer, D., & Winston, F. K. (2017). Executive function capacities, negative driving behavior and crashes in young drivers. International Journal of Environmental Research and Public Health, 14(11), 1314.

[127] Wani, M., & Dar, A. A. (2017). Optimism, happiness, and self-esteem among university students. Indian Journal of Positive Psychology, 8(3), 275–279.

[128] Wilde, E. A., Bigler, E. D., Hunter, J. V, Fearing, M. A., Scheibel, R. S., Newsome, M. R., Johnson, J. L., Bachevalier, J., Li, X., & Levin, H. S. (2007). Hippocampus, amygdala, and basal ganglia morphometrics in children after moderate-to-severe traumatic brain injury. Developmental Medicine & Child Neurology, 49(4), 294–299.

[129] Willcutt, E. G., & Pennington, B. F. (2000). Psychiatric comorbidity in children and adolescents with reading disability. The Journal of Child Psychology and Psychiatry and Allied Disciplines, 41(8), 1039–1048.

[130] Williams, P., Jamali, H. R., & Nicholas, D. (2006). Using ICT with people with special education needs: what the literature tells us. Aslib Proceedings.

[131] Wilmot, A., Hasking, P., Leitão, S., Hill, E., & Boyes, M. (2023). Understanding mental health in developmental dyslexia: a scoping review. International Journal of Environmental Research and Public Health, 20(2), 1653.

[132] Wilson, J., Hogan, C., Wang, S., Andrews, G., & Shum, D. (2022). Executive function moderates the relationship between temperament and psychological difficulties in middle childhood. Child Neuropsychology, 28(6), 831–852.

[133] Xie, J. (2020). On the exploration of a mobile executive functioning coaching solution for students with and without disabilities in post-secondary STEM education. International Journal of Mobile Learning and Organisation, 14(2), 136–160.

[134] Yahaya, R., Apaak, D., &Hormenu, T. (2021). Body image, self-esteem and health behaviour among senior high school students in Offinso Municipality of Ashanti Region, Ghana. Journal of Physical Education and Sport Management, 12(1), 11–18.

[135] Yakut, A. D., & Akgul, S. (2023). A systematic literature review: The self-concept of students with learning disabilities. Learning Disability Quarterly, 07319487231182407.

[136] Yang, B.-R., Chan, R. C. K., Gracia, N., Cao, X.-Y., Zou, X.-B., Jing, J., Mai, J.-N., Li, J., & Shum, D. (2011). Cool and hot executive functions in medication-naive attention deficit hyperactivity disorder children. Psychological Medicine, 41(12), 2593–2602.

[137] Yawn, C. D., Hill, J. M., Obiakor, F. E., Gala, D. T. D., & Neu, J. (2013). Families and students with learning disabilities. In Learning disabilities: Practice concerns and students with LD (Vol. 25, pp. 175–188). Emerald Group Publishing Limited.

[138] Ye, B. (2023). Research on the executive function of left-behind children in urban primary schools and its countermeasures. Journal of Education, Humanities and Social Sciences, 11, 365–370.

[139] Yenduri, G., Kaluri, R., Rajput, D. S., Lakshmanna, K., Gadekallu, T. R., Mahmud, M., & Brown, D. J. (2023). From Assistive Technologies to Metaverse–Technologies in Inclusive Higher Education for Students with Specific Learning Difficulties: A Review. IEEE Access.

[140] Zambo, D., & Brem, S. K. (2004). Emotion and cognition in students who struggle to read: New insights and ideas. Reading Psychology, 25(3), 189–204.

[141] Zelazo, P. D. (2020). Executive function and psychopathology: A neurodevelopmental perspective. Annual Review of Clinical Psychology, 16, 431–454.

[142] Zelazo, P. D., Müller, U., Frye, D., &Marcovitch, S. (2003). The development of executive function in early childhood: VI. The development of executive function: Cognitive complexity and control--revised. Monographs of the Society for Research in Child Development.

[143] Ziadat, A. H., &Sakarneh, M. A. (2022). Academic achievement and self-regulated learning from parent's perspective of student with learning difficulties. Int J Eval & Res Educ ISSN, 2252(8822), 1029.

[144] Zografou, M., & Drigas, A. (2022a). The role of executive functions and ICTs in anxiety management of children with learning disabilities. Scientific Electronic Archives, 15(8).