

BOOK REVIEW: DEMETRIOU, A., SPANOUDIS, G., GREIFF, S., PANAOURA, R., VAINIKAINEN, M., KAZI, S., & MAKRIS, N. (2024). EDUCATING THE DEVELOPING MIND: A DEVELOPMENTAL THEORY OF INSTRUCTION. ROUTLEDGE, LONDON AND NEW YORK, TAYLOR & FRANCIS. 278 PAGES. ISBN: 978-1-003-18748-6 (EBK)

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Article Info

Keywords: cognitive development, personality, genetic constraints, environmental constraints

DOI

10.5281/zenodo.14906621

Abstract

This article reviews Demetriou, Spanoudis, Greiff, Panaoura, Vainikainen, Kazi, and Makris's book, which explains how children process their thinking and how their reasoning faculty functions and develops as they grow. The book draws ideas from a social constructivist perspective of Lev Vygotsky, Jean Piaget, and Jerome Bruner and empirical studies over 40 years to emphasise the importance of children's minds in the teaching process and in the construction of learning. The book proposes a strong framework and strategy for developing and enhancing children's cognitive thinking and processes. The book discusses how development occurs around cognition and calls for guided constructive teaching for young learners. It provides information that can help individuals take charge of their learning process.

School is a place that makes children's minds active and a challenging environment where children learn foundational mathematical and numeracy skills that lead to more complex skills in science. It brings children with different backgrounds, characters, interests, abilities, skills, and needs together to achieve a common goal. It is expected that schools will teach the background knowledge needed for children to have a basic understanding of every subject upon which advanced knowledge of the subjects can be developed. Demetriou et al. (2024) explored four aspects of the mind: learning in education, how the mind develops, the organisation of the mind and how it works, and individual differences in its organisation. Therefore, learning is influenced by how children's minds are processed and how their mental abilities function to acquire new knowledge or understand what is being taught at a given time. The book argues that learning happens as a result of the relationship among the essential factors that limit; the standard and effectiveness of documenting, representing, and processing information that is particular to the domain of learning and development of an individual, aspects which have connections with the skills for improving, presenting, and processing information based on experience, as well as the learning aspects that are credited to biological processes that enable the incorporation of individual factors that has to do with the

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value-based decision regarding the cultural values and different areas of knowledge and learning in every domain. This argument guides the authors to provide an in-depth explanation of how individuals process information, thought, and reasoning and how they are connected to the human ability to solve problems and be able to make decisions based on areas of knowledge that promote social and cultural values.

The book has 16 chapters, which are organised into 3 main groups. Chapter one is a stand-alone chapter that explains the main ideas of the book, while the other chapters are grouped into 2-6, 7-10, and 11-16. Chapter 1 establishes that personality is connected to how human cognition impacts school learning and that every subject area usually employs a unique strategy to investigate their area of interest. This explains that there will be variations in the way concepts are defined in this book. According to Demetriou et al. (2024), “individual differences in ability reflect differences in biological construction of the structures underlying mental processes and environmental influences in the functioning of human development (p. 5)”. It was explained that genetic and biological constraints affect how children learn and develop, and these factors are different from child to child. Every child is different in ability, interest, needs, personality, behaviour, character or attitude, and family background. As children are different in all these areas, so are their teachers. Every teacher has a unique background, education, knowledge, personality, abilities, instructional strategy, level of caring, attitude, behaviour, and proficiency. This suggests that every child needs to be studied and given adequate attention so that teachers can identify their talents and areas of interest to help them make use of their cognitive skills and talents in the learning process.

The authors describe genetic constraints as chromosomes that have to do with the building of organisms that form the brain, which account for human intelligence, while biological constraints explain how people’s relationships with the world are dynamic in the genes. Bueno (2019) also supported the notion that genetic factors play a significant role in the development of the intellectual ability of children from early childhood to late childhood because they improve the cognitive functioning that helps children in their learning processes. This also resonated with Rutter (1985), who stated that learning is affected by the biological and environmental factors that make up a child’s cognitive ability, such as age, sex, nutrition, pregnancy issues, socioeconomic background, parents’ genes, and their basic needs. All these factors are very significant for the growth, development, and learning of children.

Chapters 2 to 6 explain “Plato’s theory, which postulated that knowledge resides in an eternal world of ideas and that reality is the reflection of this world, which unfolds knowledge as people develop and are activated by the environmental simulation that explains intelligence as hierarchically constructed (p. 11).” Human knowledge and thought, which are accumulated over the years, interact with various domains such as causal, spatial, social, language, quantitative, and categorical domains that have to do with the physical, biological, psychological, and social worlds. This shows that the rules and procedures in every domain of learning are developed by the contribution of knowledge and belief. These chapters also address three previous research studies regarding the construction, uniqueness, and development of the human mind from birth to early childhood, where the authors categorise levels of cognitive development into four, which are at birth, 2, 7, and 12 years.

The authors explained how learning and knowledge acquisition relate to individual personality traits as well as how personality relates to children’s cognitive skills to influence learning, which affects their specific needs and interests and differences in individual social and cultural backgrounds. This is because no two individuals are the same, and these differences affect the structure and development of the brain. The first research findings addressed in this book established that there are age boundaries (at birth, 2, 7, and 12 years) at which important developmental changes occur that build children’s understanding of the world. The second research considers the

changes in developmental priorities, the form of command in those developmental priorities, and the urgent phases that occur in each of these four levels, while the third research reveals the areas of truth that can be comprehended in a varying degree across the dominant developmental patterns. Demetriou et al. (2024) asserted that the human mind operates as a component with strong control and connection processes. In the human developmental process, several areas or elements process various information about the environment and senses, as well as reflection on human perception related to language, geographical location, and numerical connections in physical settings. They further stated that, in a physical setting, integration is important to enable behavioural adaptation, which includes self-management, monitoring, and self-control. In these chapters, we have established that reasoning is the language of thought, which can be inductive, analogical, or deductive reasoning.

Chapters 7 to 10 discuss previous studies that have attempted to predict academic performance through the lens of individual cognitive ability and personality procedures within the confines of the developmental domain to improve intellectual skills that can be attributed to reasoning and awareness. Demetriou et al. (2024) asserted that the development of cognitive skills results from human intelligence and that the processing of information through the development of the brain is based on how genetic or biological factors are formed. This suggests that heredity also plays a significant role in brain formation and development. Research has shown that maternal nutrition, infection, stress levels, and care during pregnancy have an effect on the development of the child's brain from the early years through adulthood (Fitzgerald et al., 2020). This also explains the dynamism that occurs in individual developmental processes because the kind of care an individual is exposed to during conception and after birth differs, which influences the rate at which an individual grows and develops as well as the rate at which they assimilate things, which accounts for differences in social and cultural contexts and why individuals show differences in ability, interests, and needs.

These chapters further discuss that children's academic performance in school is related to age, their attitude towards learning, interest, and intelligence, which can be traced to both environmental and biological factors. This implies that there is a relationship between learning age, intelligence, and academic performance in children. The age of a child determines the kind of learning a child will be exposed to in school, and the level of intelligence of a child determines how a child will comprehend what is being taught for better academic performance. Demetriou et al. (2024) believed that individuals perceive things differently and explained the "Theory of Mind" as what "enables children to take the perspective of others, reflect on how different perspectives engender different appearances and mental states, and how, in turn, different mental states cause different beliefs, desires, and behaviours (p.135)." This shows that individual perception depends on their thoughts, levels of reasoning, intelligence, and how things or situations appear to them.

It was suggested in these chapters that the ultimate objective of education and schooling should be to make every child a problem-solver (consciously or unconsciously) through critical thinking, intellectual ability, and application of knowledge that has already been acquired. Making a child a problem-solver is very demanding for teachers because the curriculum focuses on understanding the content knowledge and not on how to solve problems. Problem-solving skills can be acquired through a "hidden curriculum" that promotes practical skills through hands-on activities, which the general curriculum does not cover. Most schools fail to embrace the hidden curriculum, and teachers are not ready to teach using problem-solving activities because it is believed that it is time-consuming, which will prevent them from teaching more content or topics.

Chapters 11–16 focus on how learning in different domains (language and mathematics) is fundamental to education and how problem-solving skills can be enhanced through education and models. Challenges faced by individuals in learning were discussed, and a framework was suggested to integrate theories that focus on dyslexia

and dyscalculia. According to Demetriou et al. (2024), language and mathematics are the major learning domains. Some cultures do not start teaching numbers to their children, but starting from birth, children are taught how to speak in their mother tongue, while mathematical symbols and numbers are taught later through formal schooling. In-depth language is taught to young children at an early stage of life in many cultures, which means that the language domain is related to culture, and it is recognised first before the mathematical domain.

The authors contend that there are stages in language learning because learning to speak one's native language is different from learning to write a language. It was also explained that reasoning is the language of thought that helps in the assimilation of knowledge, that is, the way we reason influences the way we talk or speak. A child might be able to speak his or her native language fluently through informal teaching, but writing the language might require formal teaching, as explained by the authors. Demetriou et al. (2024) went further to explain various points of view on learning and development and integrate intellectual development theory to explain the social and cultural direction of development and how it influences classroom practises. In addition, the authors extensively explore the cognitive processes involved in language learning. A detailed analysis of phonetics, grammar, and semantics, furthered with the emphasis on integrated education, and strategies that provide useful guidance for educators wishing to enhance language proficiency within their curriculum were explained. According to the authors, there are three main levels of language acquisition that are crucial for linguistic capability growth, which are.

- **Phonetics:** This level is concerned with the sounds of language and how they are made and heard. The authors noted that at this stage of teaching, effective pedagogical strategies should focus on the phonemic awareness needed to develop reading and writing skills. They further established that "the process of teaching phonetics needs a careful approach based on repetitive exercises as well as interactive ones that consider auditory and vocal abilities (p. 156)."
- **Grammar:** At this level, the organisation of words into meaningful sentences occurs, which is called syntax or sentence structure. In addition, they stated that, "grammar instruction should not only focus on rules but also on the application of these rules in diverse communication contexts (p. 157)".
- **Semantics:** Learning strategies are intended to broaden the vocabulary required for efficient and clear communication as well as to improve the comprehension of the language in terms of the meanings of words and phrases. Real-life situations and examples should be included in teaching strategies to help students grasp word meanings more deeply, which will facilitate and enhance their language study memory.

The chapters strongly support the fusion of language learning into wider educational frameworks. Language skills are essential not only for communication but also for academic achievement in all subjects. The authors assert that "integrating language learning into the broader educational framework facilitates not just linguistic development but also cognitive and academic growth across disciplines (p. 159)". To create a more coherent and supportive learning environment, this integration involves matching the cognitive levels of language instruction with those of other subjects. Demetriou et al. (2024) further highlighted the pedagogical approaches that are needed at different stages of the language acquisition process. They emphasised that teaching methods must be flexible, technology must be used in language teaching, and teacher training is essential for successful language instruction delivery.

In addition, the authors provide an extensive analysis of the role of mathematics education throughout history, noting that it has shifted over time from being focused on computation in ancient civilisations to being concerned with computational thinking and technology integration now. "The curriculum emphasised understanding mathematical concepts over rote memorisation (p. 162)." This chapter shows how mathematics transformed from

a tool for ancient civilisations in solving problems to one that played a pivotal role in rational inquiry and scientific discovery during the orientation period. Therefore, the present-day curriculum is oriented towards experiential learning and real-world applications. Consequently, rote memorisation was replaced by giving priority to problem-solving and concept development when teaching mathematics, as described in this book, thus indicating the importance of cognitive and developmental theories on educational practises are.

Issues related to learning disabilities, such as dyslexia and dyscalculia, were also covered "Specialised educational approaches tailored to individual learning needs (p. 184)" are suggested by the authors, who combined these problems with more general theories of cognitive development. Pane et al., (2017) and Aliyeva, (2022) also support that an individualised approach is essential for helping students who face difficulties so that they can overcome obstacles and succeed in school. The emphasis is shifting to pupils who struggle academically, which highlights the obstacles and specialised teaching methods for this group. The focus of this discussion is on creating supportive learning environments. Demetriou et al. (2024) discussed the similarities and differences between certain developmental problems, such as dyslexia and ADHD. The findings from both typical and atypical developmental research can be integrated into educational frameworks to support inclusive education, as chapter 14 demonstrates. To improve educational outcomes for all students, especially those facing significant learning challenges, strategies like differentiated instruction and the creation of specialized curricula that address their unique needs are needed.

It was established that no educational technique is perfect; the authors stress the critical influence that socio-cultural contexts have on how students learn and advocate for a "holistic understanding of educational contexts (p. 201)," which considers everything from societal ideals and their effects on schooling to familial histories and community standards. The author appeals to educators to consider factors other than cognitive abilities when creating curricula, arguing that they should also consider the cultural and social dynamics that have an impact on students' learning by promoting educational models that can adjust to various diverse contexts. This method encourages equality and inclusivity and ensures that teaching strategies are applicable to a range of student backgrounds and real-world situations.

Finally, the book examines the historical development of educational approaches and forecasts future developments that may influence learning environments. This study examines how teaching approaches have evolved across time, from rote learning to more modern advancements that use digital technologies, highlighting how earlier educational approaches have prepared the way for more recent and revolutionary developments. The introduction of AI into education may be a revolutionary force that furthers individualised instruction and makes it more flexible and sensitive to the demands of individual learners. The last chapter further emphasises the need for educational systems to continuously adapt to new pedagogical theories and technological advances by charting the history of educational reforms and projecting future developments.

The authors concluded that children are active participants in the teaching and learning process and the construction of knowledge. Teachers are required to develop children's critical thinking skills, which is an essential part of choosing, assessing and analysing information to integrate intellectual ability into real-life situations and to draw on the available information to make informed decisions concerning different future assessment outcomes. The author establishes that critical thinking entails illustrations, opinions, ideas, and theories to discover alternative situations under which these elements of critical thinking could be accepted and that children demonstrate critical thinking when they concentrate more on important information to make sense of the task presented to them. Education that promotes critical thinking in schools should enable students to become conscious of the logical processes involved in the development of teaching and learning processes. This

book presents a strong argument for adaptable educational institutions that are responsive to external forces of cultural, social, and technological change, as well as students' own cognitive changes. They contend that education should be inclusive, meeting the many and changing requirements of every student, and be efficient in reaching academic goals. Regardless of a student's background, this holistic approach guarantees that learning is relevant and accessible to them, thereby preparing them for an ever-changing environment.

One of the unique features of the book is that the authors gave an overview of the entire book at the beginning, and a summary of each chapter was given at the end of each chapter. The book offers the necessary guidance needed to help teachers overcome assumptions or misjudgments regarding the domains of learning, development, and levels of reasoning, develop new skills and ideas, and provide information that can help individuals take charge of their process of learning until they can cope or handle future challenges with total independence. The book also builds a framework that connects cognitive developmental priorities with educational or learning priorities in a developmental space to demonstrate how children's personalities intersect and relate with their cognitive skills to influence learning, from childhood to adolescence. *Educating the Developing Mind: A Developmental Theory of Instruction* is an essential book for teachers, especially those working with children at their formative stages, and anyone, including parents who want to improve their knowledge about children's cognitive development as well as the various developmental stages that occur during the early years of life.

However, there are some limitations that may affect its overall usefulness and reception. The first limitation of this model is that it relies heavily on theoretical frameworks and extensive empirical studies, which can be difficult for practitioners seeking practical and straightforward strategies to apply in diverse classroom settings. This might mean that such material would become less accessible to a broader audience who would benefit from its findings because of its theoretical density and academic language because cognitive psychology or developmental theories might not be known by all educators. Another limitation is that it focuses mainly on cultural and contextual considerations. Despite advocating holistic comprehension of educational contexts, examples and research mostly reflect Western educational systems and values. In non-western contexts where education norms and values are different; this narrow focus may limit the applicability of the book. Different cultural backgrounds among teachers may find out that these strategies do not completely resonate with their specific needs within their learning environments or address their needs at all. Lastly, the book is also one that gives a perspective on integrating technology into education, especially on Artificial Intelligence. Nevertheless, it does not seem to consider the ethical and practical concerns resulting from their use in totality. Some of these include matters around equity, access, and perhaps commodification of learning. The excitement of technological solutions can smother efforts to tackle the widespread differences in the quality of education. Consequently, despite offering an important theoretical framework, the book may lack practical solutions for such immediate multifaceted problems.

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