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# A Basic Commentary on Inclusive Education and Brain Plasticity for Research

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**Abstract**

This commentary discusses the topic “Inclusive Education and Brain Plasticity: A basic Commentary for research” and reflects on its implications for inclusive pedagogical practice. The author highlights the importance of brain plasticity on educational inclusion and the value of their enrichment throughout a person's school life.

**Keywords:** Inclusive Education, Brain Plasticity, Educational Inclusion, Educational Experience, Inclusion, Neuroplastic Brain, Inclusive Learning and Brain Plasticity

## 1. Introduction

It is fact that "*Momentum is continuing to grow in the circulation of neuroscientific discourse, informing aspects of how we live but affecting too how we think about education and learning*" (Billington, 2017). So, modern educational research highlights the importance of neuroplasticity as a foundation for inclusive education from therapeutic and pedagogical approach (Gazerani, 2025; Moya-Pérez et al., 2024). The principles of neuroplasticity argue that all students, regardless of their specificities, can develop skills in environments that respect diversity and foster active participation (Dubinsky & Hamid, 2024; Guy & Byrne, 2013; Jaeggi & Shah, 2018). Enriching educational experiences throughout an individual's life can enhance an individual's inclusion. The article offers a focus on the value of continuity of educational practices as experiences (Voss et al., 2017) and their reinforcement across the spectrum of individuals' school lives. These practices relate to curriculum design and implementation, continuous professional development, staff teams and workforce composition, and setting-level monitoring and assessment (Supporting inclusion..., 2025)

## 2. Reflection and Commentary

The fundamental descriptive concept that connects educational development, the educational process, and educational progress and experience with the morphological and functional development and adaptation of the brain is the core functional neuroanatomical term, **brain plasticity** (Hawkins, 2021). This term essentially includes the creation of new synapses and neuronal circuits as a consequence of various, different, and diverse stimulating conditions from the environment, as well as the broader effort to apply cognitive skills, thoughts, and actions.

According to (O'Donnell et al., 2021), characteristic examples of the brain's morphological and functional capacity expressed as brain plasticity—and particularly related to learning and, more broadly, education—include the development of abilities in blind students who read using the Braille system; in musicians, especially those who, due to an accident, experienced morphological changes such as amputation of limbs; and finally, in young adults learning acrobatic skills, where coordination and synchronization of movements through neuromuscular inclusion play a crucial role. This inclusion is directed and controlled by specific brain functions, which are themselves the final result of the morphological and functional plasticity of the brain (Pedro & Antonio, 2019).

Overall, educational opportunities—particularly when significantly enhanced compared to the past—constitute an external environmental stimulus that triggers and expresses brain plasticity as an additional mechanism to confront and compensate for deficit conditions that developed later in time, typically after the natural maturation of the brain has been completed. It should also be noted that, purely for neurophysiological reasons, brain plasticity manifests more intensely and dynamically during younger age periods (Puderbaugh & Emmady, 2025).

In this way, it can be stated that the morphological and functional plasticity of the brain is both necessary and a fundamental prerequisite for future learning and cognitive development

(Dinse, 2021; Wenger & Kühn, 2021; Mundkur, 2005). The normal functional and morphological development of the brain requires time and reaches high levels during the early stages of adult life. Various types of environmental influences—such as deprived, typical, and enriched environments—correspondingly affect brain development. For example, children raised in institutional settings from birth demonstrate lower intelligence quotients compared to non-institutionalized children. In contrast, placing children from such backgrounds into foster families before the age of two results in a remarkable increase in IQ, up to normal levels (O'Donnell et al., 2021).

## 3. Significance and Conclusion

Finally, a reliable and general recommendation for optimal brain development may be the following: "For the full realization of an individual's potential, rich early experiences should be followed -later in life, when higher-order neural networks mature- by other, even richer and more refined experiences" (O'Donnell et al., 2021, pp. 127–129). This commentary aims to reflect on the perspectives presented in that work for implementation in diverse educational contexts.

## Conflict of interest

The author declares no conflict of interests.

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