

Educational Guidance in the Light of Neuroscience

Ali Jaber

Department of basic science, Faculty of Pharmacy, Lebanese University, Hadath, Lebanon.

***Corresponding Author:** Ali Jaber. Department of basic science, Faculty of Pharmacy, Lebanese University, Hadath, Lebanon.

Received Date: September 23, 2024 | **Accepted Date:** September 30, 2024 | **Published Date:** October 11, 2024

Citation: Ali Jaber (2024), Educational Guidance in the Light of Neuroscience, *J. Brain and Neurological Disorders*, 7(3): DOI:10.31579/2642-973X/125

Copyright: © 2024, Ali Jaber. This is an open-access article distributed under the terms of The Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Educational support plays a pivotal role in enhancing the quality of the teaching workforce, significantly impacting the overall standard of teaching and learning within educational institutions. Just as educators shape students' daily experiences, those who guide and support teachers can profoundly influence their professional trajectories. This paper aims to align educational neuroscience with educational support, drawing upon the latest research in this interdisciplinary field. Furthermore, the objective is to inspire and enlighten stakeholders engaged in this endeavor.

The effective provision of support unfolds through four distinct stages: the initial contact stage, the diagnostic stage, the restitution stage, and finally, the monitoring and impact stage. Each stage leverages specific characteristics of neuroscience, with clearly defined outcomes and anticipated impacts on the mentor-teacher relationship and the teacher's performance. Recognizing the unique nature of every educational system, we refrain from offering one-size-fits-all solutions. Instead, we present a nuanced exploration of insights from educational neuroscience, encouraging supporters to tailor their approach within each supporter-educator dynamic.

Key Words: anxiety; attention; relationships; and sleep

Introduction

Educational support (ES), through guidance and counseling, decisively impacts teaching practices [1]. While guidance typically involves offering pre-packaged solutions by listening to an individual's problems, counseling empowers individuals to craft suitable solutions to their issues [2]. In this context, we discuss ES as encompassing both processes. Educators face significant challenges, and being an educational advisor requires a nuanced approach akin to a surgeon using their scalpel with care. In recent decades, educational neuroscience has emerged as a vital field of research and practice [3, 4]. Neuroscience has influenced educational practices in numerous ways, offering insights into how factors such as anxiety, attention, relationships, and sleep affect educational outcomes [5–7]. Current research endeavors aim to elucidate the workings of the human brain, emphasizing that understanding the mechanisms of learning is crucial for effective teaching [8, 9]. Significant advancements in neuroscience—particularly with modern techniques such as electroencephalography and functional MRI (fMRI)—have revolutionized our ability to observe brain activity non-invasively [10–12]. Consequently, educational and training practices can no longer overlook the achievements and insights of contemporary neuroscience. Child- and family-centered counseling practices, which also address the emotional support and career guidance needs of educational staff, appear more effective in responding to children's issues [13].

Over the past years, the COVID-19 pandemic has introduced new challenges to educational support, particularly in the realm of distance communication. In addition to global crisis, there are the wars for instance

currently taking place in Lebanon and Palestine. This manuscript seeks to explore what and how it is possible to support educators in light of educational neuroscience, aiming to answer the question: "What can neuroscience bring to the world of ES?"

2. Effective support

It's well established that "one-size-fits-all" approaches to professional development fail to meet individual needs [14]. Therefore, support for educators must be tailored to the unique environments and challenges they face. In chemistry, chemists talk about collision theory [15], where only efficient collisions lead to product formation. Thus, the collisions of the reagents will not necessarily lead to products. Similarly, educational support must be effective and strategically aligned to achieve desired goals.

Not every interaction with a teacher guarantees a successful outcome, nor will an approach deemed effective for one educator necessarily translate to another. Outcomes cannot be universally applied without considering the specific contexts and circumstances of the individuals involved. Thus, effective support arises from a thoughtful methodology and an adaptable approach.

Since the onset of the COVID-19 pandemic, distance education has become a necessity. This shift necessitates remote learning and support to mitigate the spread of any pandemic [16]. This approach inevitably leads to remote learning and a fortiori remote support, to control the spread of the disease.

According to Arpin and Capra (2008) [17], "To support teachers today, it is important to know their culture, to take into account their abilities and the reality of their daily work, particularly when the challenges of their professional practice are numerous". Donnay and Charlier (2008) [18] establish that "to accompany is to enter into a relationship". While according to Vial [19] "Support is a meeting".

Effective support relies on a personal exchange that can only occur when both parties are on the same wavelength. This requires overcoming any perceptions of superiority on the part of the advisor and addressing any insecurities felt by the teacher.

Two main obstacles in the guidance process, the first one is what is known as false equivalence. And this last term is a fallacy in which one treats things, based on flawed or false reasoning, as the same when they aren't the same [20]. The second obstacle is known in psychology as the

endowment effect. In the economy, this bias occurs when we overestimate something we own, regardless of its target market value [21]. Beauvais M. [22] believes that support is based on three ethical principles which are as follows: the principle of responsibility, restraint, and doubt. So, accompanying person must cause doubt in the accompanied person, in order to drop his confidence and the endowment effect within, which is necessary for any decision that will have a long-term effect.

3. The different stages of support

The support can be divided into four stages, it begins with first contact, then the diagnosis stage (analyze the situation and plan the action), followed by the restitution (acting), and finally the fourth stage monitoring and impact (regulating).

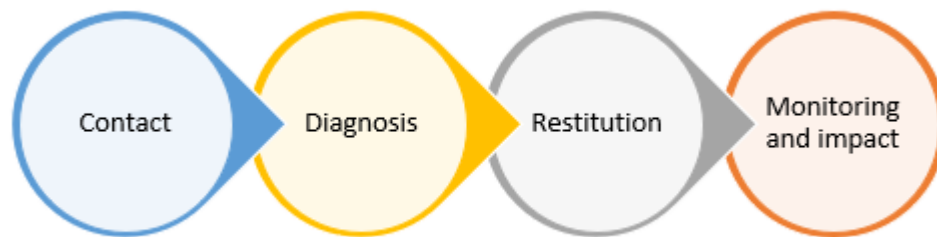


Figure 1: The four stages of support

3.1 Making contact

Making contact is the first stage in the process of support operation. Teachers not only interact with their students at school but also interact to a large extent with their peers [23]. Therefore, school is not only a place where teachers only do education, this is also one of the most important environments for them to acquire social skills, interact with colleagues, discuss with them and even learn from their experiences. Making contact is a decisive phase in which the advisor should establish a climate of trust, adopt an attitude of understanding: no judgment, be open, avoid preconceptions, give the necessary time and guarantee the confidentiality of comments and data. Although "good" stress makes efficient and improves cognition and learning, beyond a certain level, it causes the opposite effect. Thus, following the first meeting or under the impact of humiliations, the teacher may become stressed. Consequently, in a state of stress, there is the secretion of cortisol and adrenaline at too high levels. Cortisol has a toxic effect; it destroys neurons in the prefrontal cortex and the hippocampus. In addition, the adrenaline secreted at a normal rate gives the energy to life. However, in a state where the amount of adrenaline becomes very high, it causes anger and anguish.

While the benevolent attitude develops cognitive faculties (memory and learning) by densifying the connections of the hippocampus (learning and memory). As it regulates emotions, strengthens the reaction to stress by secreting oxytocin. The latter is the hormone of love and trust and triggers the secretion of dopamine and serotonin.

3.2 Diagnostic stage

The American inventor Charles Kettering (1876-1958) stated "a problem well stated is a problem half solved" [24]. Thus, the starting point to solve any complicated situation is a decisive step in every journey to find solutions. During this second stage, a good environment must be ensured, reassuring the teacher in a healthy and calm situation is also needed. Throughout this stage, cognitive neuroscience predominates. The latter is a field of neuroscience, two-dimensional, which studies the functioning of the brain, the biology of thought, mental life, emotions, and behaviors [25]. Better understand the brain to teach better, a fundamental understanding of the brain through which everything is evaluated. In other

words, cognitive neuroscience seeks to use observations from studying the brain to unravel the mechanisms of the mind [25]. Brain processes come together to affect our thinking and understanding of the world of music and how the brain develops and learns [26]. Thus, the supporter person should benefit from the intellectual dimension of the cognitive neuroscience studying the cerebral mechanisms of cognition (how the brain enables the mind), and from the affective and social dimension studying the cerebral mechanisms of emotions, feelings, relational capacities, and their impact on the person.

This stage should pave the way for the following third stage. It gives counselors as well as teachers who use particular models, an understanding of how they work or an opportunity to stop using unnecessary methods. Supporters should fit to the learner's situation and institutional constraints [22, 27], they should as well free themselves from the teaching posture "teacher habitus" [28]. According to Kant, the "other" is considered as an end in itself, never merely as a means, it is precisely in this that its dignity consists [29]. Thus, learners have the right to make mistakes, considered as a stakeholder in the process.

Neuroscience research shows us that not only action but also emotions, bodily sensations up to body states can be shared between humans. Empathy is "based on our ability to recognize that others are similar to us, but without confusion between ourselves and the other" [30].

Decety [30] distinguishes three forms of empathy. Emotional empathy is the first one marked by sharing the emotions and feelings of others. Cognitive empathy is the second, knowing by understanding the intentions of others (independent of emotional neural networks). And the last is the cognitive-emotional empathy resulting from a mix of emotional and cognitive aspects of empathy. It combines a comprehension of the other's perspective and what things mean to the other with knowledge of the emotional importance of events.

On the other hand, we must seek self-empathy. The latter is empathy for oneself by accepting one's emotions.

In addition, the counselor should avoid competition and comparison which blocks the secretion of oxytocin, particularly during

interdisciplinary projects the teacher should come into contact with his colleagues.

Individuals can either be proactive and involved or passive and detached, depending on the social conditions in which they develop and function [31]. Previous research has shown that teachers' emotional support is very important for students' social functions and academic participation [32]. But what about the teachers themselves? Recently, studies have shown that socio-emotional behaviors have positive impacts on the personal and professional lives of teachers. It starts from the sense of belonging and motivation at work based on the wisdom attributed to Plato "Never discourage anyone who continually makes progress, no matter how slow" [33]. It passes also by the high sense of competence leading to enhance the intrinsic motivation. *Competence* is the psychological need to exert a meaningful effect on one's environment [34]. Intrinsic motivations refers to the spontaneous tendency "to seek out novelty and challenges, to extend and exercise one's capacity, to explore, and to learn" [35]. Moreover, classroom behavior can be improved through an enhancement in the relationships between teachers and students [36]. Furthermore, the works of Greenglass et al. concluded that greater co-worker support contributed to the prediction of burnout, particularly to decreased depersonalization and increased feelings of accomplishment [37].

3.3 Restitution stage

During the third stage of "restitution", besides all aforementioned progress in neurosciences, other contributions can help ESs to better performance during the accompaniment. The supporter must ensure that the accompanied should be present physically, but also intellectually and emotionally to be able to perceive all information. Most often, teachers are motivated to increase their skills during this stage, and the rapid development of neuroscience research opens up new advances that can

help them view teaching and learning methods from a new perspective. The restitution must be done in light of the three crucial contributions of neuroscience. The first one is the "brain plasticity" (neural plasticity, neuroplasticity), which describes the brain's ability to reshape its connections throughout life in response to the environment and the experiences of the individual stimuli [38, 39]. It is the brain's permanent ability to rebuild itself into neural circuits. In addition, plasticity is affected by the environment (the effect of epigenetic factors) hence the importance of the choices made, to take care of one's mind and body as well as the importance of person-environment interactions. Studies into neuroplasticity contribute to the prosperity of our social orders as this feature is associated with learning and memory, mental health and homeostasis, sensorial preparation, and recuperation from mind injuries [38].

The second contribution is the distinctive class of neurons the "mirror neurons". The "mirror neural systems" was identified in the 1990s by Rizzolatti [40–42]. For instance, it has been proposed and demonstrated by neuroscientists that the failure of medically autistic children to communicate with individuals and life circumstances relies upon a malfunction of the mirror neuron system [43, 44]. Furthermore, several works concluded that the mirror neuron system is involved also in emotions and empathy [45, 46]. Coming back to our educational framework, the activity of these neurons is observed when the subject, in our case the teacher, performs a physical act towards a goal and when he observes, or hears others perform the same act. Professional training begins with imitating the coach, it influences the development of his emotional and intellectual brain. With the era of technology and social media the absence of spatial communication, both verbal and non-verbal digital interactions increasingly are occurring.

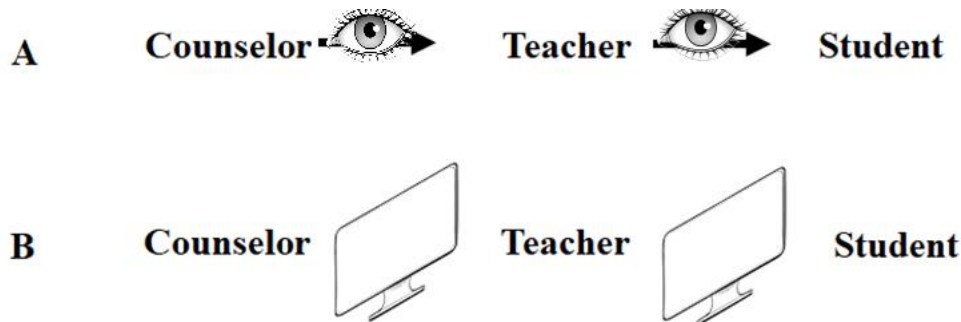


Figure 2: Relations before (A) and after (B)

Emotional intelligence describes the ability of people to understand and deal with the emotions and feelings of others. It often explains the success of an individual, the high IQ is not enough to face the trials of life.

3.4 Monitoring and impact

For the fourth stage "monitoring and impact", the metaphor often used "brain is like a forest" [47] helps teachers a lot in their learning and with their students. In a dense forest, the repeated passage of the walker gradually creates a path that is increasingly easy to follow. When the brain is called upon repeatedly to complete a task (training), it develops neural "paths" so that it can do the task easier and faster. If the brain is used only rarely for any task (lack of training), the neuronal connections associated with this learning gradually weaken until they disappear. So the brain has a remarkable ability for adapting to environmental changes [48].

At last collaboration between brain sciences and learning, sciences are not unanimous among all educational players. A lot of limitations can manifest as the educational relationships are unique and complex with each teacher. In addition, neuroscience does not replace the pedagogical

knowledge, necessary for the optimization of teaching and learning. Regarding educational advisers, it is up to them to benefit from neuroscience and to follow all discoveries not only in neuroscience but in all areas related to pedagogy and learning.

Conclusion

In this paper, we have presented how insights from neuroscience can significantly enhance educational coaching and support. The four stages of support—contact, diagnosis, restitution, and monitoring—reveal the integral role neuroscience plays in effective educational guidance. Importantly, effective educational supporters, like learners and teachers, are not produced merely by following prescribed procedures. Often, they must navigate antecedent issues and develop improvisational solutions [49].

References

1. Direction des ressources éducatives (2013). Cadre de référence sur l'accompagnement du développement professionnel
2. Neero S (2016). Guidance and counselling in education. Directorate of Distance Education, Tripura University

3. Wilcox G, Morett LM, Hawes Z, Dommert EJ (2021). Why Educational Neuroscience Needs Educational and School Psychology to Effectively Translate Neuroscience to Educational Practice. *Front Psychol* 11 :3977.
4. Gkintoni E, Dimakos I, Halkiopoulou C, Antonopoulou H (2023). Contributions of Neuroscience to Educational Praxis: A Systematic Review. *Emerg Sci J* 7 :146–158.
5. Carew TJ, Magsamen SH (2010). Neuroscience and Education: An Ideal Partnership for Producing Evidence-Based Solutions to Guide 21st Century Learning. *Neuron* 67 :685–688.
6. Goswami U (2006) Neuroscience and education: from research to practice? *Nat Rev Neurosci* 7 :406–413.
7. Dubinsky JM, Hamid AA (2024) The neuroscience of active learning and direct instruction. *Neurosci Biobehav Rev* 163 :105737.
8. Buffalo EA, Movshon JA, Wurtz RH (2019). From basic brain research to treating human brain disorders. *Proc Natl Acad Sci* 116 :26167–26172.
9. Bădoi-Hammami M (2023). Utilizing neuroscience research to enhance learning strategies and optimize curriculum design. *Int J Adv Res* 11 :797–811.
10. Académie des sciences (2004). Le cerveau. *Lett. L'Académie Sci.* 12
11. Yen C, Lin C-L, Chiang M-C (2023). Exploring the Frontiers of Neuroimaging: A Review of Recent Advances in Understanding Brain Functioning and Disorders. *Life* 13 :1472.
12. Awuah WA, Ahluwalia A, Darko K, Sanker V, Tan JK, et al., (2024). Bridging Minds and Machines: The Recent Advances of Brain-Computer Interfaces in Neurological and Neurosurgical Applications. *World Neurosurg* 189 :138–153.
13. Adelman H, Taylor L (2012). Mental Health in Schools: Engaging Learners, Preventing Problems, and Improving Schools. *Contemp Sch Psychol* 16 :163–166.
14. Elliott K, Julison J, Katz N, Parris J In Support of Educators: Strategies That Work. 18.
15. IUPAC (2019). Compendium of Chemical Terminology, 2nd ed. Compiled by A. D. McNaught and A. Wilkinson. Blackwell Scientific Publications, Oxford (1997).
16. Kucharski AJ, Klepac P, Conlan AJK, Kissler SM, Tang ML, et al., (2020). Effectiveness of isolation, testing, contact tracing, and physical distancing on reducing transmission of SARS-CoV-2 in different settings: a mathematical modelling study. *Lancet Infect Dis* 20 :1151–1160.
17. Arpin L, Capra L (2008). Accompagner l'enseignant dans son parcours professionnel: une pratique d'accompagnement pédagogique cotrnée sur la personne de l'enseignant en développement de compétences professionnelles. Chenelière Education, Montréal
18. Donnay J, Charlier E (2008). Apprendre par l'analyse de pratiques: initiation au compagnonnage réflexif. Presses Universitaires de Namur, Namur, Belgique
19. Vial M (2007). L'accompagnement professionnel: une pratique spécifique
20. Phillips HR, Bostian P (2015). The purposeful argument: a practical guide
21. Kahnemen D, Jack K, Richard T (1991). Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias. *J Econ Perspect* 5 :193–206.
22. Beauvais M (2004). Des principes éthiques pour une philosophie de l'accompagnement. *Savoirs n* 6 :99–113.
23. Muñoz-Hurtado J (2018). The role of teachers on students' peer groups relations: a review on their influence on school engagement and academic achievement. *Límite Arica* 13 :30–43.
24. Cierpka M, Thomas V, Sprenkle D (2005). Family Assessment: Integrating Multiple Clinical Perspectives. *Hogrefe Publishing*
25. McClelland JL (2001). Cognitive Neuroscience. In: International Encyclopedia of the Social & Behavioral Sciences. *Elsevier*, pp 2133–2140.
26. Cognitive Neuroscience. In: MIT McGovern Inst.
27. Winter DE, O'Raw MP Literature Review of the Principles and Practices relating to Inclusive Education for Children with Special Educational Needs. 100
28. Perrenoud P (2012). Le travail sur l'habitus dans la formation des enseignants. Analyse des pratiques et prise de conscience. De Boeck Supérieur
29. Kant I (1996). The Metaphysics of Morals. Cambridge University Press
30. Decety J, Ickes W (2009). The Social Neuroscience of Empathy. MIT Press, Cambridge, MA, USA.
31. Ryan RM, Deci EL (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. - *PsycNET. Am Psychol* 55 :68–78.
32. Farmer TW, Lines MM, Hamm JV (2011). Revealing the invisible hand: The role of teachers in children's peer experiences. *J Appl Dev Psychol* 32 :247–256.
33. A quote by Plato.
34. Legault L (2017). The Need for Competence. In: Zeigler-Hill V, Shackelford TK (eds) Encyclopedia of Personality and Individual Differences. Springer International Publishing, Cham, pp 1–3
35. Di Domenico SI, Ryan RM (2017). The Emerging Neuroscience of Intrinsic Motivation: A New Frontier in Self-Determination Research. *Front Hum Neurosci* 11
36. Varga M The Effect of Teacher-Student Relationships. 42
37. Greenglass ER, Burke RJ, Konarski R (1997). The impact of social support on the development of burnout in teachers: Examination of a model. *Work Stress* 11 :267–278.
38. Mateos-Aparicio P, Rodríguez-Moreno A (2019) The Impact of Studying Brain Plasticity. *Front Cell Neurosci* 13 :66.
39. Green CS, Bavelier D (2008). Exercising Your Brain: A Review of Human Brain Plasticity and Training-Induced Learning. *Psychol Aging* 23 :692–701.
40. Giacomo R, Fogassi L, Vittorio G (1999) *Les neurones miroirs*. In: Poulascience.fr.
41. Rizzolatti G, Sinigaglia C (2008) *Neurones miroirs* (Les). Odile Jacob.
42. Gallese V, Fadiga L, Fogassi L, Rizzolatti G (1996). Action recognition in the premotor cortex. *Brain J Neurol* 119 (Pt 2) :593–609.
43. Ramachandran VS, Oberman LM (2006) Broken mirrors: a theory of autism. *Sci Am* 295 :62–69.
44. Dapretto M, Davies MS, Pfeifer JH, Scott AA, Sigman M, Bookheimer SY, Iacoboni M (2006). Understanding emotions in others: mirror neuron dysfunction in children with autism spectrum disorders. *Nat Neurosci* 9 :28–30.
45. Gallese V (2001). The “shared manifold” hypothesis. From mirror neurons to empathy. *J Conscious Stud* 8 :33–50
46. Preston SD, de Waal FBM (2002). Empathy: Its ultimate and proximate bases. *Behav Brain Sci* 25 :1–20; discussion 20-71.
47. Masson S Pour que s'activent les neurones. 2
48. Bryck RL, Fisher PA (2012). Training the brain: Practical applications of neural plasticity from the intersection of cognitive neuroscience, developmental psychology, and prevention science. *Am Psychol* 67 :87–100.
49. Jones N, Saville N, Salamoura A (2016). Learning Oriented Assessment. Cambridge University Press



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article, Click Here:

Submit Manuscript

DOI: [10.31579/2642-973X/125](https://doi.org/10.31579/2642-973X/125)

Ready to submit your research? Choose Auctores and benefit from:

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more <https://auctoresonline.org/journals/brain-and-neurological-disorders>