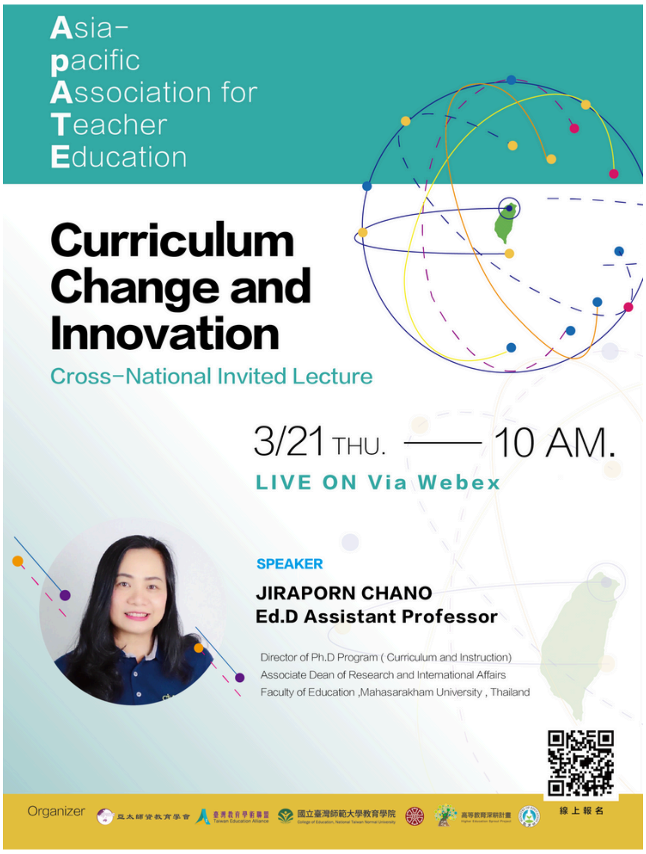
亞太師資教育學會
Asia-Pacific Association for Teacher Education

NEWSLETTER

Issue 003 April, 2024/Vol. 002

Recent /Upcoming Activities



WHAT IS CURRICULUM ?

Currere = running course
Curriculum as Subject Matter
Curriculum as Objectives
Curriculum as Plans/Program
Curriculum as Learners' Experiences
Curriculum as Educational Activities
Curriculum as Educational Evaluation
Curriculum as a Planed Learning Environment
Curriculum as the cumulative tradition of organized knowledge

CONCEPTIONS OF CURRICULUM

1.**Humanistic** : Provide personally satisfying experiences for each student. Self-actualization.
2.**Social reconstructionist** :Societal needs over individual interests. Effect social reform and generate a better future for society.
3.**Technological:**Accountable by producing evidence which indicates that curriculum attains intended objectives. Efficiency and accountability.
4.**Academic:** Subject matter disciplines and to organized fields of study. Mastery of the kind of knowledge commonly found in to rational

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Dr. Frederick Leong is a Professor of Applied Psychology at the Chinese University of Hong Kong, Shenzhen China. He was a Professor of Psychology at Michigan State University where he served as the Director of the Consortium for Multicultural Psychology Research.

As a leading scholar in Diversity Psychological Science, he has authored or co-authored over 300 journal articles and book chapters and also edited or co-edited 24 books.
He is Editor-in-Chief of the Encyclopedia of Counseling (Sage Publications) and the APA Handbook of Multicultural Psychology and the APA Handbook of Psychotherapy (APA Books).

He is the Founding Editor of the Asian American Journal of Psychology and served as the Associate Editor of the American Psychologist and the Archives of Scientific Psychology.
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Upcoming Activities

The Asia-Pacific Association for Teacher Education (APATE) is pleased to announce its 2024 Annual Conference, which will take place from November 1st-2nd of 2024. The conference theme is " Transdisciplinary Research and Practice in Teacher Education."

Aligned with the global commitment to achieving the UN's Sustainable Development Goal for Quality Education by 2030, our conference aims to explore transdisciplinary approaches within the realm of teacher education. The conference invites scholars, policymakers, educators, administrators, and postgraduate students in teacher education to submit their abstracts or full paper that investigate innovative and collaborative practices, addressing the multifaceted challenges and opportunities in teacher education today.

Theme: Transdisciplinary Research and Practice in Teacher Education

Sub-Themes:
1. Approaches to effective teacher education structures
2. Strategies for inclusive and equitable educational practices
3. Implementations of emerging technologies in teacher education
4. Collaboration for effective teacher training in higher education
5. Framework for environmental, health, and sustainability education in teacher training.
6. Practices for professional development among educators
7. Strategies for teacher education responding to societal challenges
8. Evolution and application of teaching theories and methodologies

Submission Due Date: July 31, 2024

https://www.apate-education.org/

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Graduate Student Shoutout

Neuromyths and Neuroeducation

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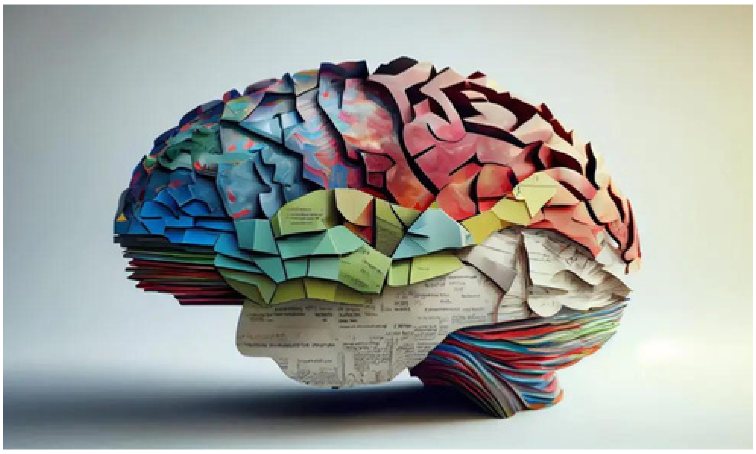
In the ever-evolving landscape of education, the persistence of neuromyths —misconceptions about brain function and learning— continues to influence teaching methodologies and educational strategies, often to the detriment of effective learning outcomes. The critical role of teacher education emerges as a beacon of change, offering a pathway to dismantle these myths through rigorous, evidence-based teaching practices that align more closely with contemporary scientific understanding.

As we navigate the complexities of the digital age, the skills fostered in educators and learners alike — particularly those related to critical thinking and informed decision-making— become indispensable in addressing the challenges and opportunities presented by the digital era. By examining how debunking neuromyths can contribute to a more resilient and informed digital citizenry, this brief literature review seeks to elucidate the indirect yet profound impact of teacher education on shaping the educational landscape, thereby preparing educators and students to navigate and contribute to a secure digital future.

Neuromyths in education

When I was younger I heard several times that our brains operate at only 10% of their capacity. Back then, I believed that idea, so much so that as naive children as my classmates and I were, we just could imagine what astonishing and immense super power a person whose brain capacity superseded the regular 10% could hold. Consider other ideas such as “a shrinking brain” due to insufficient hydration (less than 6 to 8 glasses of water per day), or exhibiting significant hemispheric differences in learning and skills development (left brain vs. right brain people); actually, several professors promoted this idea when I was attending my bachelor’s classes a few years ago.



Another “classic” one is being able to learn only during “critical periods” for certain types of information, so much so that education has to be smashed within those specific periods, therefore forcing young children to learn like there is no tomorrow because any day is a day lost, and, in turn, preparing the field for a bunch of opportunistic businessmen ready to offer parents “avant-garde” methods to foster young children’s education and development, because “the older a person is, the more impaired for learning is”.

The term neuromyth was first used by neurosurgeon Alan Crockard (Howard-Jones, 2010), in the 1980s to describe unscientific beliefs about the brain prevalent among doctors. Nonetheless, neuromyths are not only prevalent in medicine, unfortunately, they have become a commonality in other fields. In 2002, the Brain and Learning project of the Organization for Economic Co-operation and Development (OECD) highlighted the widespread misconceptions about the brain and mind outside of the medical and scientific communities. They redefined neuromyth as a “misconception generated by a misunderstanding, a misreading or a misquoting of facts scientifically established (by brain research) to make a case for use of brain research in education and other contexts” (OECD, 2002).

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Research conducted across various countries and cultural backgrounds has shown a widespread acceptance of neuromyths among teachers. This situation is alarming and suggests that the inclusion of neuroscience in teacher education programs is insufficient, leaving educators under-equipped to evaluate the claims of educational initiatives purportedly grounded in neuroscientific research.

Table 1
Prevalence of neuromyths among practicing teachers in five different countries

Myth	Percentage of teachers who "agree" (rather than "disagree" or "don't know")				
	United Kingdom (n=137)	The Netherlands (n=105)	Turkiye (n=278)	Greece (n=174)	China (n=238)
We mostly only use 10% of our brain	48	46	50	43	59
Individuals tend to learn more effectively when the information is presented in a manner that aligns with their preferred learning style, such as visual, auditory, or kinesthetic.	93	96	97	96	97
Coordination exercises provided in short periods can improve integration of left and with hemispheric brain function	88	82	72	60	84
Difference in hemispheric dominance (left brain or right brain) can help to explain individual differences among learners	91	86	79	74	71
Children are less attentive after sugary drinks and snacks	57	55	44	46	62
Drinking less than 6 to 8 glasses of water a day can cause the brain to shrink	29	16	25	11	5
Learning problems associated with developmental differences in brain function cannot be remediated by education	16	19	22	33	50

Note: The table presents the percentage of teachers from four different studies conducted in the United Kingdom, The Netherlands (Dekker et al., 2012), Turkey (Karakus & Howard-Jones, 2014), Greece (Deligiannidi & Howard-Jones, 2014), and China (Pei et al., 2014), who agreed with statements representing several prevalent myths. These studies asked teachers to express their level of agreement (agree, don't know, or disagree) with these myths. The percentages reflect those who chose "agree" (Howard-Jones, 2014).

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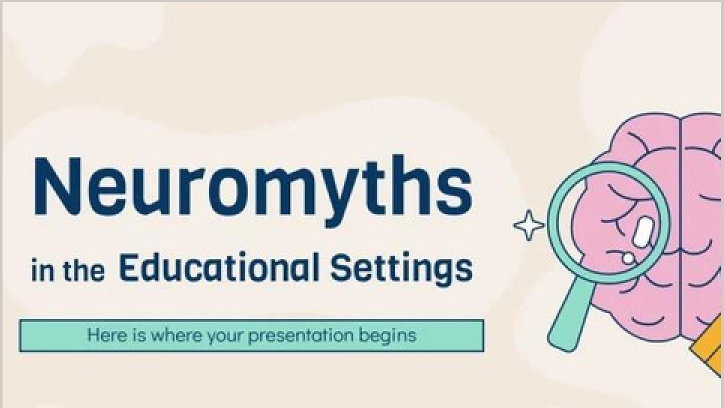
The origin of neuromyths and a few examples



Neuromyths typically originate from misunderstanding, misinterpretation, or in some cases, a deliberate distortion of scientifically verified facts, aimed at making a compelling argument for mass media diffusion or for other, often profit-driven, purposes. Nevertheless, even the most far-fetched neuromyths often have a hint of scientific truth at their core—a small fact that gave rise to the myth and continues to lend it credibility—. For instance, the widely debated recommendation to drink 6 to 8 glasses of water daily does not have concrete evidence supporting its essentiality for preventing underperformance in school children.
However, research indicates that dehydration can affect cognitive functions (Cheuvront & Kenefick, 2014), (Masento, et al., 2014) and may explain why a significant number of teachers in the UK and Turkiye believe that not drinking enough water can lead to "brain shrinkage".

One of the most pervasive neuromyths (and widely spread among educators) is the belief that students learn best when instruction aligns with their supposed preferred learning style, namely: visual, auditory, or kinesthetic. This myth has garnered various purported neuroscientific explanations, suggesting that because different brain regions are responsible for processing different types of sensory information, instruction should serve the dominant sensory modality of the learner's brain. However, this overlooks the brain's complex interconnectedness, and there is a lack of evidence from educational research and controlled studies to support teaching based on the learning style premise. While individuals may have learning preferences, and presenting information through multiple sensory channels can enhance learning, it does not justify the concept of unique learning styles for each student (Dehaene, 2020).

A still common misconception in the realm of education is the idea of "right brain versus left brain learning". This notion, often promoted by those outside the specialist community, suggests that the left hemisphere is responsible for logic and verbal information, while the right hemisphere handles creativity and visual information. Over time, this concept has become exaggerated, leading to the belief that individuals' abilities and characteristics are solely the result of one hemisphere's dominance. This has led to claims, for instance, that artists are predominantly "right-brained" and mathematicians are "left-brained".

Research by Dehaene (1999) has indeed shown that the left hemisphere plays a key role in processing verbal representations of numbers (e.g., "one", "two"), but his studies also reveal that both hemispheres are active when recognizing Arabic numerals (e.g., "1", "2"). Further research on reading processes have demonstrated that both hemispheres are engaged in various subtasks, such as decoding written words and recognizing speech sound. Interestingly, tasks traditionally associated with the "right-hemisphere ability", like encoding spatial relationships, are actually performed by both hemispheres, albeit in different manners. The left hemisphere excels in processing categorical spatial relationships (e.g., above/below or left/right), while the right hemisphere is better at handling metric spatial relations (i.e., estimating distances). Neuroimaging studies confirm that both hemispheres are activated for these tasks and collaborate closely. The brain functions are a highly integrated system, with different parts rarely working in complete isolation. While certain tasks may be predominantly handled by one hemisphere, most activities require the cooperative function of both hemispheres. This illustrates how specific and sometimes limited research interpretations can evolve into widely accepted neuromyths.

Is crucial to critically evaluate the findings and implications of research, before applying any of them to educational settings. Some key questions to consider include as follows: Is this finding supported by other studies, or is it an isolated case? Do the studies merely describe observations, or do they test specific hypotheses? Is the learning task used in the research suitable for the intended population, such as school-aged children? These considerations are essential for discerning the applicability of research outcomes to educational settings.

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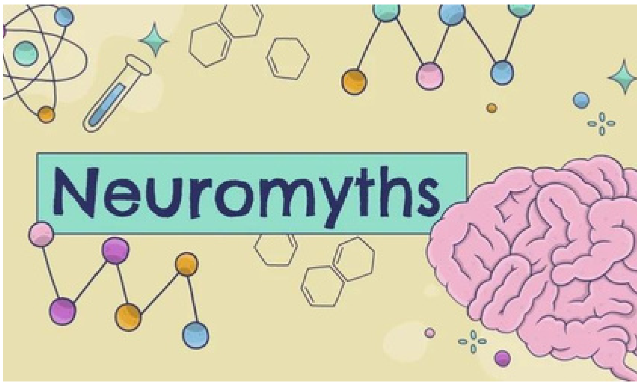
Neuroscience and education: Neuroeducation

Neuroscience, an interdisciplinary field merging neurology, psychology, and biology, has advanced significantly in the past century, enhancing our understanding of the brain's physiology, biochemistry, and structure. With about 100 billion neurons interconnected through numerous synapses, one of the primary objectives of neuroscience is to decipher the mechanisms by which the brain functions. It is believed that specific neural activity patterns correspond to distinct mental states or representations. Learning involves changes in our neural connectivity, either through synaptic potentiation or the reinforcement or elimination of connections, effective teaching strategies can influence brain function by modifying these connections. Consequently, the integration of educational and neuroscientific research is crucial (Goswami, 2004).

However, it is important to note that education professionals typically do not explore learning at the cellular level. Effective learning also hinges on various elements such as the curriculum, the teacher, classroom and family environments, and the broader societal context. Despite the close relationship between teaching and learning, neuroscience has not extensively studied teaching practices. Teaching, defined as a form of "natural cognition" by Strauss (2003), is a unique human activity characterized by the intentional act of knowledge transmission, reflecting a critical aspect of human nature. Although education research focuses on identifying effective teaching methods, this area remains largely unexplored in cognitive neuroscience. In other words: we are still starting to understand what makes our brain so special in terms of dedicating so many resources to the task of teaching and learning (Rueda, 2020). There are some studies on neural adaptations resulting from specific educational interventions, like literacy programs for dyslexic students, but wider inquiries into the neural basis of teaching are scarce.



Strauss (2005) raised the possibility that neuroimaging techniques might soon explore whether specialized neural circuits facilitate different teaching strategies. Teaching involves complex social interactions, including the ability to understand others' thoughts, motivations, and emotions — areas already of interest in cognitive neuroscience— although nowadays (2024) placing fMRI or MEG machines in classroom settings is still science fiction. Thus, cognitive neuroscience could significantly inform the development and implementation of educational programs, enhance teaching quality, and aid in the early identification and support of special educational needs (Patil et al., 2022).

Nevertheless, it is crucial to remain realistic about the contributions of brain science to education, acknowledging that while neuroscience offers valuable insights, it should complement rather than replace traditional educational research methods.

Over the last few years, numerous critical evaluations have examined how neuroscience might beneficially inform educational theories, policies, and practices, as noted by researchers like Byrnes (2001) and Blakemore & Frith (2005). Political interest in bridging neuroscience with education is apparent, exemplified by the OECD's international project, Learning Sciences and Brain Research (OECD, 2007). Various journals, reports, and books have scrutinized neuroscience insights for their educational relevance, often correcting prevalent misconceptions in the process (Dehaene, 2020). This body of work has advanced the notion that neuroscience could contribute with valuable insights to education, encouraging a growing number of distinguished neuroscientists to produce research directed at educational practitioners.

Nevertheless, neuroscience has not always received a warm welcome among educators. Endorsed by 136 scientists, skepticism about the universal application of neuroscience to education became evident at a conference on Early Education and Human Brain Development in Santiago, Chile. This group issued a declaration, supported by the James S. McDonnell Foundation (2007), asserting that the state of neuroscientific research at that time did not offer a robust foundation for guiding educational policy, practices, or parenting strategies. While the declaration's cautious stance is widely acknowledged, its underlying skepticism is palpable.

An editorial covering the declaration emphasized that neuroscience was not yet ready to link brain activity with educational outcomes, warning of the potential for misunderstandings about the brain that could mislead the public (Hirsh-Pasek & Bruer, 2007). Despite these concerns, a notable shift has occurred, with many researchers now engaging in interdisciplinary studies that connect neural learning processes with practical educational results. Interestingly, some researchers involved in these pioneering studies were also signatories of the Santiago declaration, indicating a nuanced perspective on the potential for neuroscience to inform education (Howard-Jones, 2010).

Creating effective connections between neuroscience and foundational educational research is essential. Bruer (1997) highlighted that cognitive psychology could play a crucial role in building these connections. He warned, though, that despite neuroscience's advancements in understanding neurons and synapses, it has not yet provided sufficient insights to significantly influence educational practices. This perspective may be overly cautious. Cognitive developmental neuroscience has identified several neural indicators that could help track developmental progress, such as language acquisition. These indicators offer valuable tools for educational inquiry. Additionally, areas showing promise for further exploration include the relationship between emotions and learning, brain plasticity and its implications for lifelong learning, the impact of physical activity on cognitive health and learning in areas like literacy and numeracy, and the interaction of two or more peers in learning activities (Wu et al., 2023).

Conclusions

Misconceptions about the brain, known as neuromyths, proliferate under cultural conditions that shield them from critical examination. These myths persist due to cognitive biases affecting our understanding of the brain. They have found their way into educational settings, facilitating their spread in classrooms worldwide, particularly with the rise of digital media and the internet. While recent years have seen improved dialogue between neuroscience and education, the biases and conditions fostering neuromyths still exist, often obstructing the integration of brain science into educational thought. The landscape now features emerging neuromyths and the resurgence of old myths in new forms, highlighting the shortcomings of simplified neuroscience messages and misunderstandings about the relationship between the mind and brain, and the concept of neural plasticity in educational policy and learning disorder discussions.

Enhanced interdisciplinary collaboration between neuroscience and education could play a pivotal role in identifying and addressing these misconceptions, fostering the development of scientifically accurate and educationally relevant concepts. A new interdisciplinary field is taking shape to facilitate this collaboration, although its advocates have not agreed on a definitive name yet, terms like "Brain, Mind, and Education", "Neuroeducation", and "Educational Neuroscience" are currently in use. This emerging field aims to not only guide educational practices but also deepen scientific understanding of how neural processes relate to the complex behaviors observed in classrooms.Research centers focused on merging neuroscience and education are being established globally.

Research centers focused on merging neuroscience and education are being established globally. Despite varying methodologies, these centers share an understanding of the challenges in bridging the gap between neuroscience and education, including significant differences in terminology and conceptual frameworks. They recognize the crucial need for neuroscientists and educators to collaborate closely. Looking ahead, such cooperation will be essential for ensuring that education benefits from neuroscience insights without succumbing to misconceptions, to neuromyths.

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Dear APATE Members and Contributors,
As we gear up for the next edition of the APATE Newsletter, we are excited to invite you to contribute your insights, experiences, and expertise to enrich our community.

Theme:
For the upcoming newsletter, we are focusing on the theme of "Teacher Education" We welcome articles that explore recent developments, case studies, and best practices related to the field of teachers education with a particular emphasis on how these innovations are shaping the cybersecurity landscape.

Submission Guidelines:
Length: Articles should be between 500 and 1000 words.
Format: Please submit your articles in Microsoft Word format.
Images: Include relevant images, charts, or graphs to enhance the visual appeal of your article.
Author Bio: Provide a brief author bio (100 words) along with a high-resolution headshot.
Deadline: The deadline for submissions is [30th June 2024].

Submission Process:
Email your articles to apate.office@gmail.com/lydiama@ntnu.edu.tw with the subject line "APATE Newsletter Submission: [Your Article Title]." Submissions will undergo a review process, and selected articles will be featured in the upcoming newsletter.

Benefits of Contributing:
Showcase Your Expertise: Share your knowledge and insights with a diverse community of professionals.
Networking Opportunities: Connect with fellow APATE members and industry experts.
Professional Development: Enhance your writing and communication skills by contributing to our newsletter.
We look forward to receiving your submissions and creating an engaging and informative newsletter together. Thank you for your continued support in making APATE a hub of knowledge and collaboration.