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Multiple Intelligence Theory is a Neuromyth? A Thematic Analysis Study

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Abstract

Multiple intelligence has confronted condemnation due to the absence of empirical and neuroscientific provision with some dismissing it as a neuromyth. Critics inquire on its practicality and claim that it probably shares neural coherence, rather than being linked with distinct brain regions. Earlier studies on the claims are too old. Study goals to discover present research showed from 2019 to 2024 to offer a thoughtful of the theory, which has been criticized as a neuromyth by researchers especially in cognitive neuroscience. A thematic analysis identified ten (10) themes from five (5) selected articles by using VOS viewer software for constructing and visualizing bibliometric networks of studies which debating the theory as a neuromyth theory. These themes are lack of empirical evidence of brain studies, interconnectedness of intelligence, bridging theory with empirical evidence, neural correlating, quantitively unmeasured, marketable profit, less experiential and rigorous academical practice, neuroscience and education and the theory is not neuromyth. Study underlines the importance of a cooperative approach between education and neuroscience. Additional research is desired to discover how the theory could be reconciled with more well-known models of intelligence and brain function to be recognized as a valid scientific theory.

Keywords: Multiple Intelligence, Neuromyth, Cognitive Neuroscience, Neural Correlating

Introduction

Each human being possesses at least eight intelligence or mental abilities, each of which exists separately and independently of the others. Intelligence can be logical-mathematical, verbal-linguistic, bodily-kinesthetic, visual-spatial musical, intrapersonal, interpersonal, and naturalistic. This intelligence is present in all individuals, though to varying degrees. Each person has a single potential that is determined not only by their heredity but also by their environment. He mentioned to it as the psychobiological, the ability to resolve issues to process a wide range of information in different ways, to find different approaches to understanding knowledge or skill and apply it in different settings or ways to make a product that has sense or worth in its cultural and social setting. Gardner's (Anonymous, n.d.). The theory contradicts the opinion that there is one type of intelligence that could be measured by psychometric tests. His notion on creativity proposes insights into how teachers can apply the teaching that encourages creativity and innovation (Morgan, n.d.).

However, this theory remains controversy and has recently received criticism as research-based theory (White, n.d.), and similarities between the intelligence and the different styles people such as learning styles, personality styles, teaching styles, thinking styles, leadership styles, etc. Other criticism says that this theory is a neuromyth and not true at all (Allix, 2000). Absence of experimental legitimacy and the neuroscientific indication for the intelligence has not been updated since 1983 (Ferrero et al., 2021). Fell (2021) questioned the verification and application of the theory as a bona fide. Bruton (2021) insisted that there is presently no knowledge regarding the linking among brain cell of intelligence. The development of transcriptomics and cellular neuroscience of intelligence can close the break between recognized genes for intelligence and the structure and function of the brain. Each intelligence possesses neural coherence not in distinct parts. His research sought to determine whether neuroscience evidence supports the neural validity of separate eight identified intelligence while neural activity in brain is correlating (Shearer & Karanian, 2017).

The previous studies were rather too old such as Klein (1997) argued that Gardner [anonymous, n.d.) faces a dilemma, a less robust version of the multiple intelligence theory would not be persuading, while a more aspiring version is not adequately backed by the evidence Gardner offers and, considered the theory as neuromyth, theory has been accused of being a neuromyth and of lacking validating evidence (Ruhak & Cook, 2018; White, n.d.). This notion may not support current neuroscience findings (Mackintosh & Mackintosh, 2011). A neuroscience study revealed that the frontal lobe is responsible for managing different types of cognitive processes, bringing into conclusion that intelligence cannot be linked to separate brain networks (Hoffman, 2013). Cognitive capabilities are interconnected rather than distinct, stimulating the idea of isolated intelligence, thought as absence rigorous scientific support and the implications of theory in educational practice and interrogated its scientific basics, contending that it may preserve misunderstandings about intelligence (Terada, 2014). It would be ideal to make a complete map of the neural correlations for each sort of intelligence. Without widely recognized methods to quantify these intelligences independently, the validity of the theory will continue uncertain and unconfirmed (Davis, et al., 2011).

Some other old educational scientists criticize that educationalists should not root in instructional and curricular assumptions upon a theory that absences establishment from neuroscience proposition (Ploeg, n.d.), and it is contentious, making this idea is difficult to investigate because of the abstract nature of intelligence designated as a combination of skills and cognitive performance (White, n.d.). Furthermore, there has been much disagreement of neuroscience in relation to education, it seems to have yielded insufficient results regarding teaching practice (Clement & Lovat, 2018), and among neuroscientists, the main opinion on intelligence is that there is either one general intelligence (g) or two sorts of intelligence (fluid and crystallized) (Berbey et al. 2013; Duncan & Owen, 2000). The theory remains more of an inspirational instructive context rather than a recognized logical model. So, more research is needed to focus on the neuro perspective of intelligence (Aghanouri, 2024). Davis et al. (2011) stated that the brain base of the theory “should be explained in the coming years. Balance research on both can lead to richer interdisciplinary research, nurturing collaboration between psychologists, neuroscientists, and instructors to develop more effective educational approaches. So, this

thematic analysis review research trying to find the latest arguments about the neuromyth theory from the perspective of neuroscience. The elaborate perspective from both cognitive and neuroscience is very important to create a balance and integrative perspective for developing a well-rounded understanding of intelligence.

The importance of reevaluating this argument lies in its straight consequences for both education and neuroscience. If MI is imprecisely applied as a scientific fact, it risks continuing misunderstandings about in what way the brain works and how learning happens. On the other hand, dismissing MI might overlook its worth as a pedagogical instrument for reassuring comprehensive and varied methods to teach. Considering the scientific and educational standing of MI is consequently vital for educators looking for actual practices, politicians marking for evidence-grounded transformation, and scholars striving to link the gap between theory and neuroscience.

This research is timely because previous reviews of MI are mostly outmoded, and more current discoveries from 2019 to 2024 offer new visions into whether the theory should still be considered a neuromyth. By leading a thematic analysis of present works, this study contributes to illuminating the efficacy and limitations of MI in both educational and scientific situations. In doing so, it not only addresses continuing misunderstandings but also highlights openings for collaboration between neuroscience and education in evolving more effective, evidence-based instructional approaches.

Methodology

The methodology for this study is a qualitative synthesis approach to explore ideas that the theory is claimed as neuromyth by cognitive neuroscience perspective. This study conducted a qualitative synthesis in the form of a deductive thematic analysis. Thematic analysis is a qualitative research method that is useful for the researchers to organize and analyze complex data in a systematical way (Dawadi, 2020). Thematic analysis captured based on the previous study through the screening process by identifying and evaluating critically the data gathered (Muhammad Naeem et al., 2025). The review employed to identify the gaps, explore the pattern in research area, so it can suggest the future research (Anonymous, 2025). Since the data is big, so the Bibliometric analysis is used to analyze several big scientific data in certain research areas (Donthu et al., 2021). To explore previous research on the idea that is a neuromyth. Publish or perish and VOS viewer software are used to collect the data engine from four quality scholarly database content which containing peer-reviewed articles from reputable and influential journals across various disciplines such as Semantic Scholar, Google Scholar, Cressref and Open Alex. This helps researchers find relevant and credible sources for their work. Publish or Perish is a software program that retrieves and explores academic citations. It utilizes a variety of data sources to find the raw citations, then investigates these and displays a range of citation Metrix including the number of papers, total citations and the h-index (Pubish & Perish, n.d.).

Formulation of the Research Question

Formulating the research question is a critical part of thematic analysis and can answer the questions of the study (Caulfield, 2019). The research questions should not be too general because it will create difficulties in searching for articles from engine databases during the

phase of identification, as result it will be difficult to analyze the data (Öztürk, 2019). The research questions should be specific but not too specific because it will reduce the number of articles related to being included (Anonymous, n.d.) So, the researcher used the PCC framework to build the research question. The framework can be helpful tools to guide the development of objectives and research questions (Hosseini et al., 2023). Frameworks like PCC (Population/Problem, Concept, Context) By using PCC framework, the research question has been focusing on the three elements that is P is the literature is neuromyth, C is the well-known multiple intelligence literature, Co is the cognitive neuroscience perspective arguing against it as a neuromyth.

Searching Strategies

This part will elaborate the strategy that will be used to produce the information from the articles to explore the research on this theory which is assumed as a neuromyth. PRISMA method is a framework for conducting systematic literature reviews. It describes how the PRISMA flow diagram was applied to identify, screen, and select appropriate research articles in a apparent and organized means (Asarae et al., 2023). The PRISMA (Systematic Reviews and Meta-Analysis) method will be used to explore the studies related to the topic. PRISMA involves the process of collecting and screening of article sources by choosing the eligible and exclusion criteria. The systematic checklist also will be conducted, including identifying relevant research, selecting primary studies, assessing quality of studies, extracting required data and synthesizing the data (Rethlefsen et al.,2022).

PRISMA

The Ideal Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) is a 27-item checklist used to progress transparency in systematic reviews (Sohrabi et al., 2021). These items cover all facets of the document, containing title, abstract, introduction, methods, results, discussion, and funding (Anonymous, 2024). PRISMA also can define clear research questions and allowing systematic checking and screening can be identified through the eligibility and exclusion criteria based on the research questions to check the big engine data effectively (Trifu et al., 2022). By using the PRISMA, it allows detailed searching related to the claim that the theory is neuromyth.

Resources

Comprehensive and advanced searching the sources from database will be done through the journal engine database, that are Semantic Scholar, Google Scholar, Cressref, and Open Alex. Semantic Scholar allows researcher to find and explore scientific publication data about authors, papers, citations, venues, and more. It provides data about authors, papers, citations, venues, SPECTER2, recommends papers like a given paper and provides downloadable links of datasets in the academic graph (Anonymous, n.d.). Google Scholar is a very powerful search engine for scientific literature that is used by many researchers and students. It is especially useful to find and access publications that you already know, or to do a quick search on a topic (Contact & Person, 2019). CrossRef includes 330 dues-paying members, representing over 1500 publishers and societies. Its database covers 13,000 journals and 18 million DOIs, including several hundred thousand DOIs for non-journal content such as books, conference proceedings, and components such as images and supplemental information. Open Alex is made by Our Research, a nonprofit dedicated to making research open. It got a decade's experience keeping tools like Unpaywall

sustainably open with a freemium business model. The index is over 250M scholarly works from 250k sources, with extra coverage of humanities, non-English languages, and the Global South. Open Alex link works to 90M disambiguated authors and 100k institutions, as well as enriching them with topic information, SDGs, citation counts, and much more (Brennan, n.d.).

Eligibility, Inclusion and Exclusion Criteria

Eligibility criteria can be divided into two, that are the inclusion criteria and the exclusion criteria. In identifying numerous research related to the research question, inclusion criteria must be there for it to be included in the review (Anonymous, n.d.). Meanwhile exclusion criteria are the features of an article that exclude the study from inclusion in a text review (Emily Jones, n.d.). The researcher must realize that if even study meets all the elements stated in the inclusion criteria and shows one element in the exclusion criteria, it would be rejected it (Brennan, n.d.). This article will take only the selected articles, The other sources like book, reviewed articles, chapters in book, and book series are excluded. The language used in articles should be in English medium. Journal articles published in the last five years from publication starting from 2019 to 2024 will be only selected to be reviewed. The keyword used to find the eligible articles is “Multiple Intelligence AND Neuromyth”, “Multiple Intelligence AND myth”, “Multiple Intelligence AND brain myth”, “Multiple Intelligence AND Neuroscientific Misconception”, “Multiple Intelligence AND cognitive Fallacy”, “Multiple Intelligence AND Neurofiction”, and “Multiple Intelligence AND Cognitive Fallacy”. Table 1 shows the criteria of eligibility and exclusion.

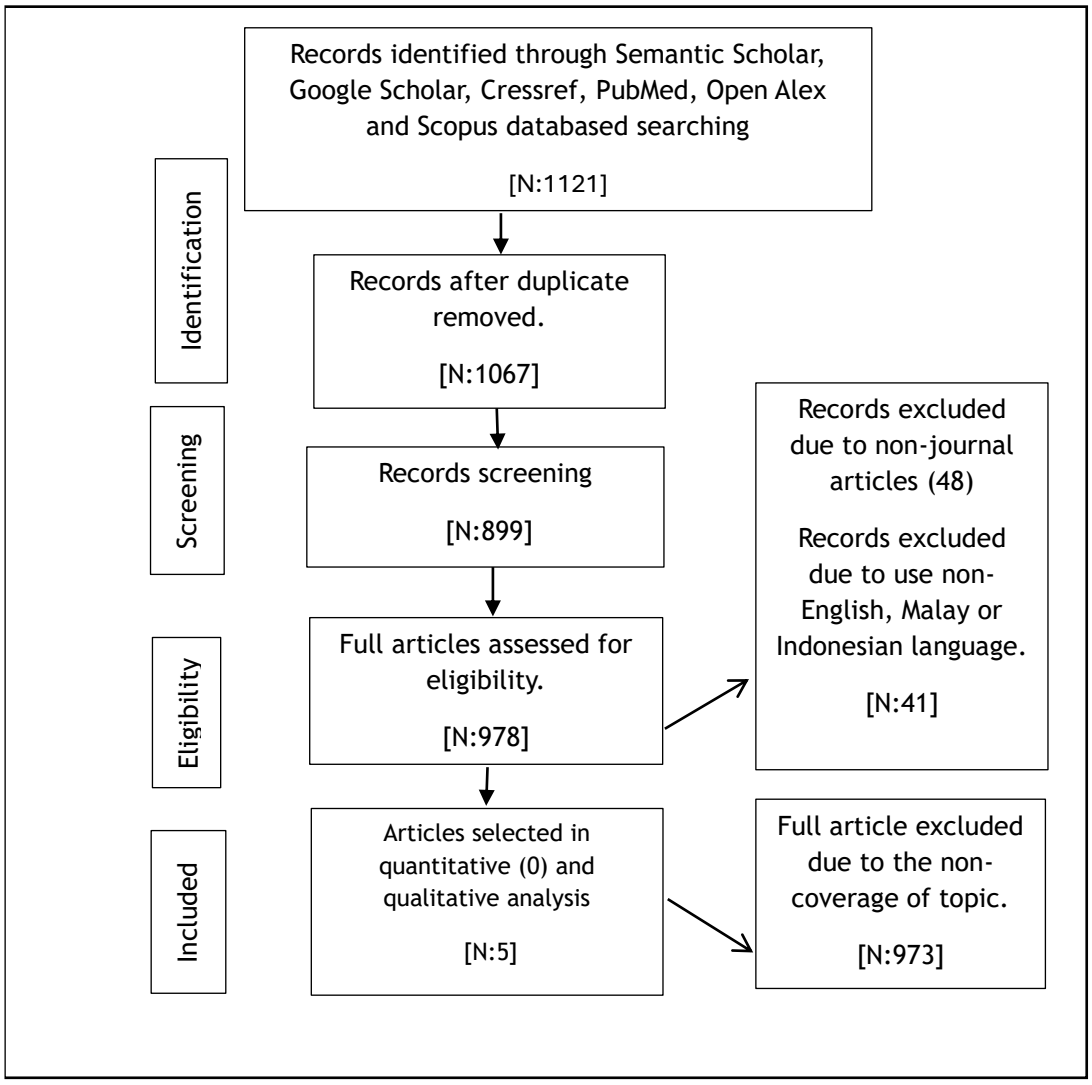
Table 1
Criteria of Eligibility and Exclusion

Criteria	Eligibility	Exclusion
Type of Document	Research Articles Journal	Book, Series in book, Chapter in book.
Language	English	Languages other than English
Research Method	Qualitative Review	Quantitative
Publication Timeline	2019 – 2024	<2019
Countries	Malaysia and outside Malaysia	NIL
Keyword Search	“Multiple Intelligence AND neuromyth”, Multiple Intelligence AND myth”, “Multiple Intelligence AND brain myth”, “Multiple Intelligence AND Neuroscientific Misconception”, “Multiple Intelligence AND cognitive Fallacy”, “Multiple Intelligence AND Neurofiction”, and “Multiple Intelligence AND Cognitive Fallacy”.	NIL

The articles were reviewed in full to determine if the articles meet the inclusion criteria. From 978 screening articles, only 5 articles met the criteria. Studies encompassed research papers from both qualitative and quantitative. Only English and Malay/Indonesian language are included as valid criteria, and data from article and proceeding not the books are measured. The replication article and proceeding will be uninvolved. The search results found in Google Scholar are 100. The search results from the Crosref database are 1000 database, OpenAlex

are 16, Semantic Scholar database is 5. databases are as many as 1121 records covering various types of material such as articles, conference papers, reviews, book chapters, brief reviews and books. Diagram 1 shows the Systematic Review Process in PRISMA model.

Diagram 1 PRISMA model



Identification of Sources

Based on the flow of PRISMA diagram, the first stage is identification the articles for review. The keywords will be identified and searched at database. Identifying stage is the process of recording, studies and tracking from other information sources (Bramer et al., 2018). The researcher will get the number of records returned from the databases search and the number of additional articles identified, then will identify the numbers of articles the search returned. The records identified is 1121.

Screening the Sources

In the process of screening, the duplicate removed. After recognizing all records from databases and other sources, researchers must remove any duplicates. Duplicates may occur from several databases or frequent entries. This stage safeguards that each single study is only counted once,

which is vital for precise data analysis. It is required to demo duplicate records in keeping data accurateness and reliability (Hammer et al., 2023). So, researchers found that the record after duplicate is 1067. The screening also had done to excluded due to non-journal articles (Brammer et al., 2018), with medium use other than English and Malay/Indonesian language (Brennan, n.d.).

Engine Database Search Frequency

The key search to find the eligibility criteria is "Multiple Intelligence AND Neuromyth". The eligibility criteria for type of publication are research article and paper concept content from year 2019 to 2024. Any books, magazines or news, writings that are not related to the theory is neuromyth and other than years required will be excluded as eligibility criteria. Table 2 shows there are five (5) engine databases searched by using Publish or Perish software, the software that publish the academic journals. According to [44] indicated that in systematic reviews, it is advisable to use multiple databases when searching for relevant data, The eligible article of Google Scholar and Scopus are 'nil' because some of related articles replicated in other databases.

Table 2
Key search finding for eligibility criteria

Databases	*N	Eligibility	Year	Authors	Citation	Journal & Publisher
Open Alex	24	1	2020	Mavrelos & Daradoumis	9	Education Science
Semantic Scholar	4	2	2023	1. Waterhouse 2. Rousseau	3 8	Frontiers in Psychology
Google Scholar	46	1	2024	Screiber	nil	SSRN
Crossref Science	912	2	2020	1. Setiawan & Surotul 2. Shearer	nil	Center for Open Science
Scopus	2	nil	nil	nil	nil	Nil

*N: Only unreplicated articles are included

Finding

Chart 1 displays the current article written and published within the year 2019 to 2024. Three (3) articles written in the year 2020 by Mavrelos and Daradoumis (2020), Setiawan and Ilmiyah(2020), and Shearer (2020). In the years 2021 and 2023, only one article was written each year by Rousseau (2021) in 2021 and Waterhouse (2023) in 2023. But in the year 2020, no article related to the theory as neuromyth theory was published. Few current research found on definite topics implies that there is an insufficient number of existing works concerning those specific topics. This can propose something such as a gap in this research matter. There may be an under-exposed area within this ground, suggesting a potential gap where more investigation is needed. Nevertheless, the topics might not be new or because

research in these areas were debated during early stage of theory found by (anonymous.). It could show a lack of thought among researchers or insufficient sources gave to study those topics. Methodological encounters may be an important barrier that may pose obstacles for researchers which indicate fewer studies are being shown. Future research highlights the area that demands more consideration or investigation. Table 3 shows five selected documents retrieved by VOS viewers.

Table 3
Five Selected Documents Retrieved by VOS viewer

Selected	Documents	Citations	Total link Strength
√	Waterhouse (2023)	2	16
√	Rousseau & Screiber (2021)	7	12
√	Mavrelos (2020)	8	8
√	Setiawan & Surotul (2021)	1	0
√	Shearer (2019)	2	0

VOS viewer analysis includes five selected documents from Waterhouse (2023), Rousseau (2021), Setiawan & Ilmiah (2020), Shearer (2019), Ferrero et al., (2021). Each document's citation count and total link strength were weighed to understand their impact and connectivity within the research landscape. The highest total link strength is Waterhouse (2019) and Rawson (2020), followed by Rousseau (2021). Mavrelos & Daradoumis (2020) has eight (8) citations shows the highest citation count among the works, showing that it is relatively influential and likely addresses a significant topic in the field. The higher citation count indicates that other researchers find it valuable for their work. Accordingly, the five (5) articles that will be used in this study. From five (articles), the process describing the keywords for defining the codes and develop the themes. This process would be carried by outlines the key points called as a deductive predefining the code for theme development. Davis et al. (2011) asserted that in the deductive thematic analysis, the data with the predetermined themes likely to find created on standing knowledge or established evaluation questions. The keywords defining were described in Table 4.

Table 4
Articles chosen for Bibliometric Analysis Study

Authors	Findings/keywords	Initial codes
Setiawan & Surotul (2021)	The concept of multiple intelligences has faced criticism due to its lack of empirical evidence and inconsistency with cognitive neuroscience findings. Questions remain about whether it meet the criteria of a scientific theory and how they can predict learning outcomes. Some scholars argue that neuroscience and education should collaborate, rather than conflict, to better understand intelligence. They suggest that the theory is interconnected cognitive skills, not separate entities, and that a combined framework from both fields could provide a more comprehensive understanding of learning.	1. Lack of empirical evidence 2.Cognitive neuroscience 3. Intelligences are dependent 4. Neural correlating
Shearer, C. B (2019)	A review of 417 neuroscientific studies investigative neural correlates for skill units inside seven intelligences initiate some consistency and uniqueness in the neural structures for each intelligence, comparable to general intelligence. Though the theory brings into line with advances in understanding brain and mind collaboration, it has been complained about offering inadequate scientific description. Gardner's model of intelligence, based on inadequate indication, has been considered insufficient by some neuroscientists. Despite this, the study proposes that theory has a coherent neural basis and could be combined with general intelligence, calling for additional research to improve and validate these ideas.	1.Neural correlating 2.Inadequate scientific explanation 3. Neuroscience 4. Theory is not neuromyth 5.Neural brainpart coherence with various intelligence.
Rousseau, L & Screiber (2021)	The study contends that the theory is not a neuromyth, but somewhat a legitimate scientific theory of intelligence. Earlier surveys disapproved the theory as a neuromyth due to the lack of indication backup its influence on learning, mainly concerning brain correlates. Gardner's investigation, including the Spectrum Project, remains untested scientifically. Despite its acceptance, the theory has been misunderstood as learning styles and absences empirical neuroscientific provision. The study advocates that the theory must not be regarded as scientifically validated but rather as an educational framework, notifying against using neuroscientific claims for marketable purposes in education.	1. Not Neuromyth 2. Lack of empirical evidence 3. Neural correlates 4. Misunderstood as learning styles 5. The theory merely an an educational framework not scientific theory 6. Marketable purposes.
Waterhouse, L (2023)	Critics label the theory as a neuromyth due to the non-existence of brain studies confirming the independence of intelligences. While little indication supports this claim, studies propose that intelligences are not independent but interconnected, as the brain functions over complex, multifunctional systems rather than distinct systems for each intelligence. Five explanations for seeing the theory a neuromyth include: 1) No standard procedures of intelligence, 2) Absence of proof for the independence of intelligences, 3) Instructional strategies based on absence valid evidence, 4) Study viewing no backing for independent	1. Not neuromyth 2. Non existing scientific brain studies 3. Intelligences are dependent 4. Neural correlating 5. Not distinct system of brain system 6. Theory is not quantitatively measured

	intelligences in academic achievement, and 5) No empirical studies connecting the theory to brain functions. Cognitive brain networks related with intelligences, such studies do not quantitatively measure brain activity during specific intelligence-related tasks, leaving the theory's neural validity unverified.	7. Neural validity unverified.
Mavrelos and Daradoumis (2020)	The study initiates that though the theory allies with Waldorf educational practices, there is inadequate neurological sign to fully provision this incorporation. Waldorf's stress on creative, holistic learning links with some of theory principles, but the absence of scientific support for distinct intelligences leaves the method's efficiency uncertain. Consequently, the theory deficiencies scientific authentication in biological, behavioural, and neuroscience fields.	1. Less experiential and academical rigorous practice. 2. Inadequate neurological signs 3. Absence of scientific method 4. Efficiency uncertain 5. Deficiencies of scientific authentication Lacking scientific authentication in biology, behavioural and neuroscience fields.

Defining Themes from Initial Codes

There are ten (10) themes identified from codes initiated from the key points, that are lack of empirical evidence of brain studies, interconnectedness of intelligence, bridging theory with empirical evidence, neural correlating, quantitatively unmeasured, marketable profit, less experiential and rigorous academical practice, neuroscience and education and the theory is not neuromyth. From these codes, the themes were assigned to get clear depth explanations of currents studies on the neuromyth views on the theory.

Conceptualizing and Interpreting Keywords, Codes and Themes

Lack of Empirical Evidence

The theory has insufficient and unreliable empirical provision with the findings of cognitive neuroscience fails to support with scientific legitimation, lack of validating brain studies, intuitive appeal, scientifically untested, little evidence has been issued to backing this prerogative, there is no base for the superiority or no observed research of the brain base of the theory, cannot be verified, rather measured this theory as educational. Additionally, it cannot verify that the intelligences have neural network and lack of evidence in term of brain part correlate (Setiawan & Ilmiyah, 2020; Rawson, 2020; Mavrelos & Daradoumis (2020) and Waterhouse (2023).

Interconnectedness of Intelligence

Numerous studies underline that the intelligence are not independent systems within the brain by viewing that they are interconnected cognitive abilities. This idea is agreed neuroscience that propose brain functions are complicated. Shearer (2019) and Waterhouse (2021) agreed that intelligences do not link to separate brain regions or isolated cognitive systems but are instead interdependent and forming part of a wider and more integrated neural cells. Setiawan & Ilmiyah (2020) further underline this interconnected notion by suggesting that the theory are well understood as a network of cognitive skills rather than isolated abilities.

This interconnectedness challenges original theory which proposed distinct intelligences such as linguistic, logical, musical, etc (ananymous, n.d.). Current research recommends that brain activity does not occur in isolated parts for each sort of intelligence but relatively contains cooperative neural systems that are not as simply separated.

Bridging Theory with Empirical Evidence

Combining cognitive neuroscience with education can move beyond theoretical applications of educational strategies. When integrated with educational theories, this can help provide evidence for or against the concept of the theory. Understanding neural relates in specific brain regions that activate during various cognitive tasks can improve the theory proposed in educational contexts. When combined with educational theories as suggested by (Rousseau, 2021). This can assist to offer indication to avoid opposing the concept of the theory as neuromyth.

Quantitatively Unmeasured

There has been no rigorous, numerical data or brain activity measurements that confirm the theory's claims. It has no concrete evidence and measurable data that shows the brain's functioning to specific in a distinct intelligence as Gardner proposed (Waterhouse, 2019; Rousseau, 2021, and setiawan & Ilmiyah, 2020). There is a study by Shearer (2019) who had brought 417 neuroscientific studies on brain correlations. Shearer's review identifies specific brain regions or networks that are activated during tasks related to different intelligences. For example, linguistic intelligence might engage language-processing areas such as Broca's and Wernicke's areas, while spatial intelligence may involve areas linked to visual processing and spatial reasoning, like the parietal cortex. Shearer's investigations reject the notion that the theory is neuromyth rather it is merely lacking scientific evidence.

Marketable Profits

Rawson (2020) and Waterhouse (2023) argue that using the theory as a marketable tool to promote concept, theory, or product in a way that is aimed at generating commercial gain. The theory would be blamed for sometimes been for promotional purposes rather than being grounded in scientific validation because it lacks scientific proof and experimental indication.

Intelligences are Dependent

It was opposed that every intelligence is not independent rather is a cognitive skill unit that has distinctiveness, coherent units, interrelating and linking each other in neural not in separate units. Each intelligence is a combination of related skills, and this explains its complex neural structure. This view opposes the theory which assumes intelligence is independent (Setiawan & Ilmiyah, 2020). Brain has part that work together for learning to take place and interdependent with each other (Rousseau, 2021). Study initiates that the frontal lobe linking dissimilar forms of cognition which give understanding that intelligences could not have distinct brain systems. Study asserted that intelligences do not function distinctly from one another but correlate. Indeed, individual forms of cognition happen in a process of continuous changes between large networks and small networks, and not in distinct content-dedicated static module (Waterhouse, 2023).

Less Experiential and Rigorous Academical Practice

[45] critique on educational approaches in the theory are seen as lacking in depth, scientific validation, or empirical rigor. In contrast, the mention of Waldorf practices brings up an example of a more holistic, experiential, and non-traditional educational philosophy. Waldorf education emphasizes the importance of nurturing intellectual, emotional and physical growth in students. Education should not just focus on academic subjects but also on personal development (Rawson, 2020).

Multiple Intelligence is Not Neuromyth

Rousseau (2023) claim that this theory is not a neuromyth, rather than merely legitimate scientific theory of intelligence, thus becoming a neuromyth because lack of evidence in term of brain part correlate. [49] claimed that although critics have considered the theory as a neuromyth, little evidence has been issued to backing this prerogative. It remains a neuromyth as well as there is no base for the superiority of teaching approaches. Study initiate that the frontal lobe governed dissimilar forms of cognition which give understanding that intelligences could not have distinct brain systems. Study asserted that intelligences do not function distinctly from one another, but correlate Research has demonstrated that the brain is organized into complicated multifunctional networks not in separate neural networks for each individual intelligence. Waterhouse (2023) assumes that there five reason why the theory is neuromyth, 1. There is no standard measures of intelligence, 2. The prove for the independence of the intelligences is lacking, only a limited studies have discovered the independence of the intelligences, moreover these studies were not based on shared standard measures of the intelligences, most studies show intercorrelation between the intelligence making it has no prove that intelligence is independent. 3. Belief in theory teaching strategies is robust but is not supported by valid evidence. 4. Problem for studies of theory teaching strategy. The successful students' academic achievement with the theory implementation shows in much research was not adequately supported that the intelligences are independent. 5. There are no empirical studies of the brain base of the theory.

Neuroscience and Education

Authors asserted that neuroscience and education must combine combined with each other, not in conflict. The education practitioners and neuroscience experts will work together in this regard produce a complete framework for various influencing factors learning. Education practitioners and neuroscience experts will work together in this regard produce a complete framework for various influencing factors learning. Shearer (2019) and Rousseau (2021) considered this theory as educational. The demanding as neuroscientific evidence merely for selling product to education agencies. They suggested that the study must conflating between brain science and educational practices. Though, Mavrelos & Daradoumis (2020) found that the theory is sufficiently can be combined into Waldorf educational practices, nonetheless there is insufficient empirical evidence to fully support this integration from a neurological viewpoint.

Neural Correlating

Despite of contradiction, Shearer (2019) argues that the theory brings into line with advances in understanding how the mind and brain cooperate contributing a real interface between pedagogy and neuroscience. In his comparative studies by reviewed 417 neuroscientific studies in examining neural correlates for skill units within seven intelligences found that

there is a degree of coherence and uniqueness among the neural structures identified for each intelligence that are comparable to what has been observed for general intelligence. There is a degree of coherence and uniqueness among the neural structures identified for each intelligence that are comparable to what has been observed for general intelligence. However, this study found that the theory described in Frames of Mind by (ananymous, n.d.) has less useful or dismissed by neuroscientists as the theory has less provide viable scientific description of complex phenomena. Cerebral structures quoted by Gardner for each intelligence, based on the incomplete neuroscience evidence have demonstrated vigorous and inadequate. This study confirms that the theoretical model proposed by Gardner has a coherent neural basis and suggests an integration of the theory with general intelligence. Hence. study suggested that intelligence requires a level of detail by other researchers to carry out study that can be useful to scientists as well as practitioners.

Conclusion

The result focus on substantial concerns concerning the lack of empirical support for the theory. Studies in cognitive neuroscience less provide robust evidence for distinct neural bases for each intelligence, with studies suggesting that intelligences are interconnected rather than independent. Similarly in educational applications also lack rigorous scientific validation, as evidenced by the absence of measurable data linking specific brain regions to distinct intelligences. Studies in both areas also did not combine and working together to get a clearer connection intelligences and neural brain part. Critics claim that the has been promoted more as an instrument for marketable advantage than as a scientifically supported theory. Despite these matters, some studies propose possible incorporation with educational practices though empirical evidence remains inadequate.

Though the theory has made an important influence on educational model, especially in encouraging distinguished instruction, its scientific legitimacy ruins debated. The absence of empirical evidence, mainly from neuroscience, casts uncertainty on its claims of independent intelligences with specific neural correlates. Instead, emergent study supports a more united opinion of cognition, where intelligence is understood as a dynamic network of interconnected cognitive processes rather than a set of separate, isolated abilities. As such, the theory may be more appreciated as an educational tool than as a scientific theory of intelligence, and more research is required to bond the gap between educational practice and neuroscience. Study stresses the necessity for an additional cohesive view of cognition, where intelligences are seen as interconnected cognitive skills rather than distinct entities. This viewpoint brings into line with current neuroscientific discoveries, which propose that cognitive developments are distributed across various brain regions and function in a dynamic, interconnected network. This change encounters Gardner's original idea of independent intelligences, supporting for a more all-inclusive understanding of brain function.

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