

E-SGIARP

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ABOUT THE JOURNAL

The SGIARP is an internationally peer-reviewed and editorially independent interdisciplinary e-journal associated with SGIARP's international seminar on "*Exploring the Neurocognitive Foundations of Mindful Education within the Framework of the National Education Policy 2020*" published by St. Gregorios Teacher Training College, Meenangadi, Wayanad, Kerala, India. We wish to support the researchers, scholars, students who are interested in initiating innovative educational endeavors to transform human minds for the establishment of "**Vasudhaiva Kutumbakam**". All publications are freely available to read online, and are completely free of publication fees. The first issue was published in April 2024 and the journal continues to publish biannually. The journal also intends to help researchers, scholars, students and everyone else who are interested in academic research activities, in publishing papers on various issues across multiple disciplines. This journal invites original contributions as well as Review articles in important methodological and substantive areas in education, humanities, social sciences.

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EDITORS WORDS

Dr. Tomy K.O.

Editor-in-Chief

Principal, St.Gregorios Teacher Training College, Meenangadi. I have immense joy and proud to welcome you all to the latest edition of this e-journal, Volume 1 Issue 1, June 2024. This e-journal intends to provide research knowledge and opportunities, for research scholars, teachers and students in the area of education. In line with the theme of education, this issue of **E-SGIARP** focuses on "*Exploring the Neurocognitive Foundations of Mindful Education within the Framework of the National Education Policy 2020*". Scholarly papers of this issue discuss about Neurocognition, mindfulness education and National Education Policy 2020 and its different dimensions. Key papers include The Interplay Neuroscience research provides a biologically driven framework for developing the performance of brain according to its natural structure and functions and when the brain is working properly, all the executive or cognitive functions are achieved with the maximum efficiency. Educational neuroscience provides opportunities as well as challenges for developing a bridge between educators, psychologists and neuroscientists.

The National Education Policy aims to provide a major transformational reform in the Indian Education System. It aims to create all its citizens to be the masters and not slaves of Nation building. Mindful Education is the core of the traditional Indian Education System. This seminar is an attempt to explore the Neurocognitive Foundations of Mindful Education within the Framework of the National Education Policy 2020.

I am thankful and wish to express my gratitude to all contributors for their time, efforts and valuable thoughts and supporting us in the preparation of this issue. I also express my thankful gratitude to all, who have extended their helping hands in their different capacities for the preparation of this issue. Constructive suggestions for the development of this e-journal are always welcome.

E-SGIARP (Interdisciplinary E-Journal)

“Education for Enlightenment”: Exploring Foundations of Mindful Education within the Framework of the National Education Policy 2020

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Abstract

This research article explores the integration of mindful education within the framework of India's National Education Policy (NEP) 2020, highlighting its potential to foster holistic student development. Mindfulness, characterised by present-centred awareness and non-judgmental acceptance, is posited as a transformative approach that addresses cognitive, emotional, and social educational challenges. The NEP 2020 emphasises equitable and inclusive education. It resonates with the benefits of mindfulness, such as enhanced attention, emotional regulation, and well-being, aligning with its goals of nurturing critical thinking, creativity, and ethical values. However, the article stresses the importance of maintaining mindfulness's spiritual and ethical roots to prevent reductionism and commodification. It advocates for a context-sensitive approach, supporting educators' well-being and professional development and tailoring curricula and training programs to diverse educational contexts. By fostering interdisciplinary learning, emotional intelligence, ethical reasoning, and environmental awareness, NEP 2020 can transform education, nurturing well-rounded individuals who contribute meaningfully to society. The policy's emphasis on technology, creativity, innovation, and community engagement further supports this holistic vision. Ultimately, the article underscores the NEP 2020's potential to create an education system that balances academic excellence with the enlightenment of the human spirit.

Key Words: Mindfulness, Holistic Education, National Education Policy 2020, Cognitive and Emotional Development, Educational Reform

Introduction

In the dynamic landscape of educational reform, mindfulness has emerged as a transformative approach to fostering holistic student development. Mindfulness, defined as a state of present-centred awareness and non-judgmental acceptance (Bishop et al., 2004), holds immense potential to address the multifaceted challenges faced by modern education systems. As the National Education Policy 2020 in India ushers in a new era of comprehensive educational reform, it is crucial to examine the role of mindfulness-based interventions (MBIs) in shaping a more equitable, inclusive, and empowering

educational ecosystem (Ergas & Hadar, 2019). The burgeoning interest in mindfulness-based practices within the educational domain has been accompanied by a growing body of empirical evidence highlighting its cognitive, emotional, and social benefits. Mindfulness has been shown to enhance students' attention, emotional regulation, and overall well-being, leading to improved academic performance and social-emotional competencies. These findings resonate with the NEP 2020's emphasis on nurturing well-rounded individuals with critical thinking skills, creativity, and a strong sense of ethical and constitutional values.

However, as the implementation of mindfulness-based interventions gains momentum, it is crucial to heed the cautionary voices against the potential for reductionism and commodification of these practices. With its deep roots in ancient contemplative traditions, mindfulness must be honored and integrated with its fundamental spiritual and ethical underpinnings to realize its educational benefits fully. By adopting a holistic, context-sensitive approach to integrating mindfulness in educational settings, the NEP 2020 can harness the transformative potential of these practices. This would involve cultivating mindfulness among students and supporting educators' well-being and professional development, who play a pivotal role in shaping the learning environment. (Hyland, 2015; Delavari et al., 2023; Roeser, 2014)

The successful implementation of mindfulness-based interventions within the framework of the NEP 2020 requires a multifaceted approach that addresses the unique needs and challenges of diverse educational contexts. This may involve the development of tailored curricula, teacher training programs, and collaborative partnerships between researchers, policymakers, and practitioners to ensure the effective and sustainable integration of mindfulness-based practices in the Indian education system. Through this lens, the National Education Policy 2020 can catalyze a paradigm shift in education, empowering students and educators alike to cultivate a deep self-awareness, resilience, and a holistic understanding of the human condition. By honoring mindfulness's spiritual and ethical foundations, the NEP 2020 can pave the way for an education system that fosters academic excellence and the enlightenment of the human spirit. (Maynard et al., 2015)

Why a New Education Policy in India?

The National Education Policy (NEP) 2020 was long overdue since the National Policy on Education of 1986 and was introduced by the Indian government after extensive preparation and deliberation. The NEP 2020 envisions a transformative approach to education, rooted in Indian ethos, to contribute directly to the country's development. It aims to transform India into an equitable and vibrant knowledge society by providing high-quality education, thereby establishing India as a global knowledge superpower. The policy is founded on five guiding pillars: Access, Equity, Quality, Affordability, and Accountability. It seeks to prepare the youth to address the present and future's diverse national and global challenges. (GOI MHRD, 2020; NCERT, 2023)

Education for Enlightenment: An Overview

The NEP 2020 emphasizes the importance of nurturing the individual's holistic development, encompassing cognitive abilities and social, emotional, and ethical capacities. Education for Enlightenment adopts a comprehensive approach to learning, extending beyond conventional academic knowledge acquisition. It aims to foster students' self-awareness, critical thinking, and emotional intelligence, with the ultimate goal of developing well-rounded individuals who are successful in their professional and personal pursuits. This educational approach emphasizes the interconnected nature of knowledge, values, and personal growth. It encourages students to examine their beliefs and assumptions while remaining receptive to new ideas and perspectives. The core tenets of Education for Enlightenment resonate with the National Education Policy 2020's vision of developing "enlightened citizens" who can contribute to the betterment of society.

Education for Enlightenment incorporates mindfulness, ethics, and social responsibility into the curriculum to empower students to become compassionate and ethically conscious global citizens capable of addressing the challenges of the 21st century. At the core of this approach is the belief that education should focus on knowledge and skill acquisition, character development, and ethical conduct. Educators serve as facilitators, guiding students to critically question and analyze information while fostering a deep understanding of themselves and the world around them. Ultimately, Education for Enlightenment aims to enable individuals to lead meaningful and purposeful lives while positively contributing to society. (Some Inputs for Draft National Education Policy 2016, 2017; Sonali, 2023)

This approach empowers students to positively impact the world through introspection, empathy, and ethical reasoning, fostering holistic development, including emotional, social, and spiritual well-being. Education for Enlightenment represents a shift towards a more comprehensive and reflective educational approach prioritizing emotional intelligence, critical thinking, and ethical conduct. Embracing this philosophy, the National Education Policy 2020 recognizes the need to cultivate skills beyond traditional academic subjects, emphasizing the importance of developing a solid foundation of values, ethical decision-making, and a sense of social Responsibility (Zhao et al., 2023; Mahmoudi et al., 2012)

Education for Enlightenment in the Perspective of NEP 2020

The National Education Policy 2020 highlights the crucial importance of developing well-rounded individuals equipped with the comprehensive knowledge, diverse skills, and universal values necessary to lead fulfilling lives and contribute positively to the betterment of society. India's groundbreaking National Education Policy 2020 represents a significant transformative change towards a more holistic and integrated approach to education, aligning with the visionary concept of 'Education for Enlightenment'. This transformative educational framework aims to cultivate not merely academically skilled individuals but also imbued with a deep sense of compassion, ethical responsibility, and a global citizen's perspective. Let us closely examine how the NEP 2020 enables and empowers this holistic and enlightenment-oriented

education, affecting various vital aspects of learning and comprehensive skill development for the 21st century and beyond.

- **Curricular Reforms and Pedagogical Innovations**

The NEP 2020 envisions a significant overhaul of the existing curricula and pedagogical approaches across all levels of education. It advocates for a flexible, multidisciplinary, and competency-based education system that moves from rote learning to more experiential and inquiry-based learning. This shift aligns with the principles of Education for Enlightenment, as it encourages students to explore diverse subjects, develop critical thinking and problem-solving skills, and cultivate a genuine passion for lifelong learning. The policy emphasizes the importance of integrating subjects across disciplinary boundaries, enabling learners to make meaningful connections and apply knowledge holistically.

- **Foundational Pillars Supporting Holistic Growth**

The National Education Policy 2020 is founded upon five core pillars: Access, Equity, Quality, Affordability, and Accountability. The policy establishes a framework for an inclusive education system that caters to all learners, ensuring universal access and making special provisions for disadvantaged groups. Furthermore, it cultivates an environment that empowers students from diverse backgrounds to pursue enlightenment-oriented education and skills development, enabling them to realize their full potential and make meaningful contributions to society.

- **Interdisciplinary Learning for a Well-Rounded Education**

A vital aspect of the National Education Policy 2020 is its emphasis on breaking rigid boundaries between academic disciplines, enabling a more fluid and interdisciplinary approach to education. This aligns with the principles of enlightenment education by encouraging students to engage in critical analysis and to synthesize knowledge from diverse fields of study. By fostering this interdisciplinary mindset, the policy aims to nurture individuals capable of tackling complex, real-world challenges that require a broad and integrated understanding of various domains. (Chawla, 2023)

- **Cultivating Emotional and Ethical Intelligence**

The policy highlights the significance of emotional intelligence and ethical considerations in education. It promotes a curriculum integrating arts, crafts, and humanities alongside scientific and mathematical disciplines. This comprehensive approach aligns with the principles of enlightenment education, emphasizing the development of character, rationality, compassion, and care – essential elements for nurturing well-rounded individuals.

- **Mindfulness and Cognitive Development**

The National Education Policy 2020 (NEP, 2020) promotes a teaching approach that is experiential, holistic, inquiry-based, and enjoyable. This pedagogy aligns well with mindfulness practices, which can enhance cognitive development. Mindfulness-based practices can improve attention, self-awareness, emotional regulation, and cognitive flexibility, providing an excellent foundation for enlightenment-oriented education.

- **Enlightenment in the Indian Educational Context**

The Indian philosophical and cultural heritage, with its longstanding focus on self-discovery and intellectual depth, aligns well with the vision outlined in the National Education Policy 2020. Traditional Indian practices such as yoga and meditation are consistent with the policy's acknowledgement of a multifaceted educational approach. This promotes the development of self-awareness and emotional intelligence, which are essential to an enlightenment-oriented education.

- **Leveraging Technology for Holistic Learning**

NEP 2020 proposes establishing an independent organisation, the National Educational Technology Forum, to facilitate discussions on using technology to improve learning, assessment, planning, and administration. Technology integration into education aligns with enlightenment principles by giving students access to diverse knowledge and resources, encouraging critical thinking, and fostering independent learning. Additionally, the policy emphasises the importance of interpersonal skills and collaboration, which can be enhanced through technology-enabled learning platforms.

- **Emphasis on Ethics and Values: Cultivating a Moral Compass**

The National Education Policy 2020 of India underscores the pivotal role of ethics and values in shaping a progressive and enlightened society. Recognising the transformative potential of these principles, the policy aims to instill a solid moral foundation in students, equipping them to navigate life's complexities with integrity and a sense of social responsibility. By integrating ethical considerations and universal human values into the curriculum, the policy seeks to nurture individuals who are not only academically accomplished but also possess a deep understanding of their place in the world, their duties towards society, and the importance of

- **Inclusive Education for All Learners: Breaking Barriers**

The National Education Policy 2020 is a shining example of inclusivity, championing the cause of providing equitable educational opportunities to all learners, irrespective of their backgrounds and circumstances. By prioritising inclusive education, NEP 2020 aims to break down the barriers historically preventing students from accessing high-quality educational resources. The policy's emphasis on catering to diverse learning needs, addressing the requirements of marginalised communities, and ensuring accessibility for students with special needs aligns seamlessly with the principles of enlightenment education.

- **Environmental Sustainability and Eco-Literacy**

Acknowledging the pressing need to address environmental concerns, the National Education Policy 2020 incorporates environmental sustainability and eco-literacy as integral components of the curriculum. By fostering environmental awareness, supporting conservation initiatives, and promoting sustainable practices, the policy aims to instil a sense of environmental stewardship and responsibility among students towards the planet.

- **Promotion of Creativity and Innovation**

The National Education Policy 2020 emphasises cultivating creativity, innovation, and entrepreneurial mindsets among students. The policy encourages learners to pursue their passions, devise innovative solutions to real-world challenges, and engage in entrepreneurial endeavours by nurturing a culture that supports creativity and risk-taking. Through establishing maker spaces, innovation labs, and entrepreneurship education programs, NEP 2020 aims to empower students to become catalysts of change and innovation within society.

- **Professional Development for Educators**

NEP 2020 acknowledges the pivotal role of educators in nurturing a holistic and enlightenment-oriented education. The policy underscores the significance of ongoing professional development for teachers, equipping them with the necessary knowledge, skills, and competencies to effectively implement innovative teaching approaches, cater to diverse learners, and promote the holistic growth of students. By investing in teacher training and capacity building, NEP 2020 aims to elevate the overall quality of teaching and learning across India. present-centred

- **Community Engagement and Partnerships**

The National Education Policy 2020 (NEP, 2020) promotes collaborative partnerships between educational institutions, local communities, and relevant stakeholders. By cultivating robust connections between schools, families, local communities, and industry partners, the policy aims to enhance the learning experience for students. Furthermore, the policy facilitates diverse opportunities for students to engage in experiential learning, mentorship programs, and the practical application of their knowledge in real-world settings.

Conclusion

The notion of Enlightenment-oriented Education holds substantial significance. India's extensive heritage encompasses profound spiritual and philosophical traditions prioritising self-discovery, ethical behaviour, and holistic well-being. This vision of Education for Enlightenment aligns with these deep-rooted traditions by emphasising the acquisition of academic knowledge alongside the cultivation of moral and ethical values, self-awareness, and emotional intelligence. The National Education Policy 2020 demonstrates a progressive and visionary approach to education that reflects the principles of Enlightenment-oriented

Education. By integrating technology, fostering ethics and values, promoting inclusive education, prioritising environmental sustainability, nurturing creativity and innovation, empowering educators, and facilitating community engagement, NEP 2020 lays the foundation for a transformation.

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Positive Classrooms: A Neuroscientific Perspective

Provisions in NEP-2020

Dr Jeny Rapheal*

Our understanding of optimal learning environments has been revolutionized by recent discoveries in brain sciences. Neuroscience urges teachers to apply principles that govern the functioning of the human brain in classrooms. This review paper attempts to gather and analyze research on the neuroscientific claim that a student's learning will be significantly affected by the emotions experienced in the learning environment. Positivity in the classroom enhances learning. The study explores to what extent NEP-2020, as an education policy, allows space for incorporating such neuroscientific findings into educational practices. Around 30 research papers on positive classrooms and 12 on holistic education were retrieved from databases like PsychNet, ERIC, MEDLINE, JSTOR, PubMed, DOAJ and Google, respectively. Only those papers dealing with neuroscientific correlates of learning/teaching were included. Cognition-emotion neural connection and social-emotion-cognition loop influencing learning and memory were the major themes that emerged. A detailed discussion has been done on how positive emotions promise positive education by influencing neural pathways of students' attention, memory and motivation. Discussion extends to contextual factors and pedagogic strategies that can create positive learning environments. This study observes that, by anchoring on holistic, flexible, integrated, multidisciplinary student-centred approaches, NEP's salient principles do justice to the latest neuroscientific findings. The thrust given on ECCE (Early Childhood Care and Education) and teacher education through ITEP (Integrated Teacher Education Programme) validates NEP's commitment to the positive education and well-being of students in India.

*Dr Jeny Rapheal, Psychologist & HSST, AIHSS, Thrissur

Introduction

Educational research usually depends upon post hoc behavioural outcomes to understand and assess learning. These methods treated learning as a product. Today we can trace the process of learning and memory formation in the brain with the help of neuroimaging techniques. Due to this our understanding of the dynamics of the learning environment also has undergone a complete overhauling.

An ideal classroom environment for learning is one where all interactions are carefully carved to safeguard the sense of joy and excitement of learners. How positive emotions optimise the brain for learning and how the absence of it in the classroom can disrupt even the best pedagogic attempts has been revealed by investigations into the brains of the students. Until then the teaching community were relying on sticks and carrots to meet the objectives of learning. Though the teacher-student relationship was stronger and more influential in the older days, it thrived upon compassion/empathy rather than on an informed understanding of the emotional life of students.

Emotion-Learning connection

Studies highlighting the influence of emotions on the key aspects of learning are galore (Fredrickson, 2005; Pekrun, 2006). Investigations into the brain with the help of modern scanning machines, revealed a pertinent thing relevant to learning. If learning is about attention motivation and memory, the regions of the brain in charge of these faculties have indelible pathways into the emotional brain. The emotion colours and even decides whether cognitive functions instrumental in learning should be active or dormant.

Judy Willis (2012) has a curious way of explaining the roles played by brain regions like RAS (reticular activating system), amygdala (CEO of emotions) and Dopamine. The RAS is situated in the lower areas of the posterior brain. It acts as a filter for an incoming host of sensory stimuli. It is impossible for us to consciously be aware of all the stimuli entering through the five senses. RAS does not permit all sensory inputs to pass through it. Only novel stimuli or stimuli relevant to the student somehow get entry through it. Novelty and curiosity can be aroused by a wide range of variations in the learning environment from a change in the voice, a change in the direction of movement of the teacher or a suspenseful pause to a novel way of introducing the concept etc Judy (2012).

Teachers need to realize that students, in their developmental phase (K-12) have very weak inhibitory control. They lack the mechanism to block unwanted distractions. According to neuroscience, no teacher should punish the child for inattentiveness. Classroom activities must thrive on novelty and curiosity to grab student attention. Moreover, we can not persuade a child's brain subjected to stress, boredom, fear, poverty or trauma to tune to the best intentions of the teacher.

The neurotransmitter dopamine ensures the flow of sensory messages across neurons for processing. Whether this flow should be initiated or maintained is determined by motivation/goal orientation/positive interaction with teachers or peers/ of the learner. However, any message from sensory inputs need to cross

the switching station “amygdala” before being transported to cognitive processing in the PFC. The amygdala checks the emotional content of the incoming message. If the input message has any negative hue such as fear, anxiety or stress, the amygdala blocks it from entering into cortical regions of PFC where real learning is orchestrated. Instead, the amygdala activates lower brain regions –the limbic system, and hypothalamus---and prepares the brain for a fight—flight—freeze response.

The emotional brain does not know how to reflect. It is “reactive”. Boredom, absence of personal relevance, lingering memories of previous failures, fear of mistakes, negative feedback, etc send messages of threat and block the processing of information given by the teacher. Thus learning is not likely to happen. Studies in psychology on how a positive mental state (happiness, pride and hope) enhances self-regulation and academic achievement reiterate this fact about students’ emotional state and its role in academic performance (Pekrun, Goetz, Titz, & Perry, 2002a; Villavicencio & Bernardo, 2013a)

Any outside stimuli generate some emotion in us. This arousal of emotion can take place in a conscious or rather in a reflexive unconscious way. Consciously evoked emotions occur when the processing of emotions adopts a cortical pathway. In this, a person is not a victim of emotion, he is in a better position to regulate it. But if processing assumes a subcortical pathway, emotions are readily transferred to the amygdala and there is a quick autonomous behavioral response from the organism (e.g. when you see a snake processing happens along subcortical regions) (Tamiotto et al., 2009)

Investigations say VMPFC (ventral medial prefrontal cortex) is crucial in processing stimuli relevant to oneself. This region is a part of our emotional brain comprised of the amygdala, medial prefrontal cortex anterior cingulate, basal ganglia, and hippocampus (Le Doux, 2000; 2012). For instance, any message from the teacher or peer that hurts the self-esteem or pride will be automatically absorbed by the student's brain and trigger stress responses from the amygdala. This is termed as self-referential processing. The regions of the emotional brain have the power to influence the decision-making process and hence motivation to learn.

According to Raymond (2009), a student’s selection of information in the classroom is determined by attention, motivation and emotion. While motivation guides attention, emotion can influence both motivation and attention. Also, the executive functions of the brain are guided and energized by emotion and motivation (Pessoa,2009).

According to Kudielka and colleagues (2012), the cortisol (stress hormone) released by adrenal glands into the blood stays there for a long time and affects memory formation and thinking capacity. Studies say that if students experience positive emotions while learning they will be more self-reliant, responsible and they self-regulate learning (Toegel, Anand,& Kilduff, 2007; Villavicencio & Bernardo, 2013a) while others are less self-reliant and need external monitoring to keep in the loop (Pekrun, Goetz, Titz, & Perry, 2002b; Villavicencio & Bernardo, 2013). In gist, the emotional component of the classroom atmosphere can never be overlooked or neglected.

The classroom is a miniature society

As social beings, “social relevance” is one of the sociological concepts that explain why we behave the way we do. The simple act of attempting to answer a question given by the teacher in the classroom has motivating factors rooted in social relevance. The students might feel obliged to respond to the teacher as they want to please the teacher, save their self-image in front of students, comply with parental expectations of classroom behaviour or perform better in the examination etc. Any academic activity a student does has a cause in societal demands/expectations.

“Intrinsic reward for having found an answer, achieving a high score, avoiding punishment, helping tutor a peer, pleasing a guardian, or even getting into a reputable university all have a strong emotional component and are connected to both pleasant sensations and to functioning within a social environment” (Immordino-Yang & Damasio, 2007).

Our social brains are primed for four things mainly --- *“detecting and processing social stimuli, mentalizing activity, bonding with others, and social learning”* (Dunbar & Schultz, 2007). We have that automatic unintentional tendency to infer the intentions emotions and beliefs of others (Mentalization). It influences our behaviour in a particular social situation (Bargh & Morsella, 2008).

“Aspects such as how learners perceive their teacher, the expectations of their behaviors, the relationships they may have with others, and how they are treated are all aspects of the learning environment that involve the social aspects of the brain and will influence behaviors that can affect academic outcomes. Having the opportunity to ask a question without being treated harshly and having positive interactions with peers allowing for productive collaboration are just two examples of how the hard-wired framework for social perception and understanding of social connections can influence a learner.” Li, L., Gow, A. D. I., & Zhou, J. (2020).

The neuroscientific structural map of the social brain includes the amygdala, the orbitofrontal cortex (OFC) the medial prefrontal cortex (mPFC) and the ACC (Brothers, 1990; Fiske & Taylor, 2008). Social cognition is largely an automatic process and even stimuli that are not in the perceptual awareness are processed by regions of the social brain such as amygdala, mPFC etc. (Adolphs, 2009). Prejudices, attributions we make, and stereotypes individuals carry in their disposition influence the subliminal processing of information their social brains make. According to Bickart (2014), three major networks --- *“the social perception, social affiliation network and social aversion”*--- have firm roots in the amygdala. This means that how a student perceives, makes or breaks social connections inside the classroom is mandated by the socio-emotional components of the classroom atmosphere.

Mirror neurons and related networks activate identical brain regions in the observer and the observer as well. (Destro & Rizzolatti, 2008; Brickart et al., 2014). This explains how there is emotional/behaviour contagion from teacher to student or student to student in the classroom. *“Emotions can silently spread from one person to another, or from one person to a group, creating a bridge between them and has unique implications in education”* (Yamamoto, 2017). According to Gallese et al., 2013, the mirror mechanism is

automatic, pre-reflective and a major ingredient of social cognition. Mentalization and mirroring work in conjunction with each other. The functioning of both is largely automatic. Enquiry-based learning, collaborative learning, classroom engagement, etc everything runs effectively on the flexibility, autonomy, respect, concern, empathy compassion pervading in the classroom. The pro-social approach in the classroom environment demands the right understanding of the functioning of the social brain and the nature of social cognition and behaviour.

Contagion of positive emotions such as pleasantness, happiness, fellow feeling, etc results in more communication, understanding, and exchange of ideas. Sutton (2008) opined that through emotional contagion, teacher's emotion will influence not only their own perception motivation and behaviour but that of their students too.

To speak of teacher empathy, there are two kinds of empathy, emotional and cognitive. Former results from emotional contagion, which is not so conscious. While the latter results from a conscious drive to "understand" the thoughts and feelings of the student (Rogers et al., 2007). A teacher needs to exercise cognitive pathways of empathy. The neural mechanisms behind both pathways are different though they are interwoven.

"A teacher being able to recognize a student struggling in their class and understanding the student's situation, students being aware of the needs of their peers and being willing to help, and students understanding when a teacher is under pressure and empathizing with them and offering to help in some way are all potential instances of empathy having a value in the classroom" Li, L., Gow, A. D. I., & Zhou, J. (2020).

Receiving feedback from significant ones for various academic activities incorporates actions of the emotional brain, reward circuit and social brain. Positive feedback is effective in student motivation while negative feedback harms it. (Bandura & Cervone, 1983).

In teaching, dynamic interpersonal communications occur explicitly and implicitly (Watanabe 2013). Positive communication always strengthens academic outcomes (Hagenauer et al., 2015). It is the impact of the teacher-student relationship on the emotional life of students that determines the cognitive outcomes in academics.

How teachers can be made aware of

Decision-making in the classroom is mainly a function of the teacher's knowledge of students, and their theoretical understanding of educational practices and beliefs, (Shavelson and Stern, 1981; Clark and Peterson, 1986; Shulman, 1987; Schoenfeld and Kilpatrick, 2008 as cited in Chang et al., 2021). Teacher beliefs act as filters for teachers' interpretation and understanding (Fives and Buehl, 2012)

Neuroscience brings deeper insights into the dynamics of teaching and learning. For example, understanding how stress can take a toll on student's attention, memory and motivation may persuade a teacher to replace punitive attitudes with social and emotional support (Brick et al., 2021). The teacher's knowledge about neuroplasticity (flexibility of the human brain) prevents her from viewing the students as fixed entities and

gives impetus for persevering for student growth and development. Knowledge about neuroscientific principles may direct the teachers to be more student-centric while designing pedagogic strategies (Tan and Amiel, 2019; Tan et al., 2019). Neuroscience can not dictate pedagogies in a specific way. However, it could explain with concrete evidence “how the neuroscientific principles influence teacher thinking and behaviour”. The teacher participants in those studies said they “already” knew it was important to take care of a positive environment in the classroom. But now they are aware of “why” it is important. Knowledge of neuroscientific principles shapes teacher behaviour in the classroom.

Shulman mentions seven kinds of knowledge a teaching professional should have. They are “*knowledge of content, general pedagogy, pedagogical content, educational philosophies, theories, curriculum, educational systems, and knowledge of students*” (Shulman, 1987). Knowledge of neuroscience contributes directly to teachers’ knowledge of students and pedagogy while indirectly influencing other spheres of knowledge.

Brain-targeted teaching focuses on improving the emotional state and physical environment and creating a productive learning environment.

Neuroscientific principles and practices

Principles	Practices
<ul style="list-style-type: none">• “Learning is <i>incremental</i> and experience-based.• Learning is multi-sensory. Neural network structures formed as the result of learning <i>will have connections to several sensory cortexes</i>—auditory, visual etc.• Brain mechanisms of learning extract structure from input.• learning is social.• Learning strengthens synapses.• Remembering reactivates plasticity.• Different behaviours use different but overlapping circuits.• Experiences and genetics shape circuit development.• Rehearsal, application and self-evaluation lead to automaticity and mastery.• Emotions facilitate memory and decision-making.• Brain pathways, while similar across	<ul style="list-style-type: none">• “Gamification It has been found that gamification is a tried-and-true strategy for fostering a supportive learning environment in the classroom.• Individualized Instruction: Tailor teaching methods to individual students’ learning styles, cognitive abilities, and developmental stages. This may involve recognizing and accommodating diverse learning profiles within a classroom.• Brain-Based Learning Strategies: Understanding how the brain learns can inform the development of effective teaching strategies. For example, educators may use techniques that align with principles of memory formation, attention, and motivation to enhance the learning experience.• Early Intervention: Insights from educational neuroscience can

individuals, are shaped by unique experiences.

- Physiology influences learning, memory and decision-making.
- Complex nervous systems promote critical thinking, reasoning, communication, creativity, and curiosity.
- Deeper learning is made possible by safe learning environments.
- The brain is uniquely organized;
- The brain is continually growing;
- Learning is associated with positive feelings in a "brain-compatible classroom";
- Children's minds must be engaged in practical, relevant, and real-world learning situations.
- Since the brain functions as a parallel processor, it can execute multiple tasks at once, such as sensation and thinking.
- Since learning involves every aspect of physiology, learning must involve both the body and the brain.
- Since the need for meaning is innate, the mind's or brain's search for meaning is very individualized.
- Patterning is a means of searching for meaning, suggesting that the brain is made to recognize and create patterns and that it is resistant to having meaningless patterns imposed upon it.
- The fact that emotions are essential to patterning suggests that emotions are brain-based and have a significant influence on decision-making.
- The simultaneous processing of parts and wholes in the brain suggests that although the left and right hemispheres perform distinct

support Early identification of learning difficulties or developmental issues.

- **Informed Educational Technology Integration:** Educational neuroscience can guide the development and implementation of educational technologies that align with the brain's learning processes.
- **Cognitive Development:** Teachers can apply knowledge from educational neuroscience to better understand the cognitive development of their students. This understanding can inform the design of age-appropriate curricula and learning activities.
- **Emotional and Social Learning:** Research from the neurosciences emphasizes how crucial social and emotional elements are to learning. With this information, educators can encourage social connections, create pleasant emotional settings, and integrate social and emotional learning (SEL) into their lesson plans.
- **Optimizing Learning Environments:** Insights from educational neuroscience can inform decisions about classroom design, lighting, and other environmental factors that may impact students' cognitive performance and well-being.
- **Professional Development:** Teachers and educators can benefit from professional development programs that integrate findings from educational neuroscience. This can enhance their understanding of how students learn and help them refine their teaching techniques.

tasks, they are meant to cooperate.

- Conscious and unconscious processes are always involved in learning, suggesting that our conscious and unconscious minds interact.
- We have at least two distinct forms of memory, suggesting that rote learning (taxon memory) and spatial memory (autobiographical memory) are made up of knowledge and abilities that are committed to memory through rehearsal and practice. The autobiographical or spatial memory creates connections between experiences, events, and facts.
- Since learning is developmental, it follows that rich home and school environments are good for kids' brains.
- Learning is stimulated by difficulty and hindered by threat, meaning that when assignments are difficult and the classroom atmosphere is encouraging and safe, students will learn best.
- Since every student's brain is different, it follows that while we are teaching, we should take into account how each student learns best. Every student has a different combination of strengths and weaknesses in their brain.
- ”

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Caine and Jeoffry Caine (1991).
Usha Goswami(2008)
(Chang et al., 2021)
Jack et al., (2010)

- **Neuroplasticity and Growth Mindset:** Teaching students about the brain's capacity for change (neuroplasticity) and promoting a growth mindset can positively influence students' attitudes toward learning and resilience in the face of challenges.
- Children's perceptions of learning in school may completely shift when they comprehend how their brains alter when they acquire new knowledge.
- **Rethinking the way we view students.** According to research, we should view each student as having unique talents, and we should adapt our teaching methods to suit their needs. When a kid is classified as "learning disabled," for instance, we often concentrate on their limitations. However, the understanding that neuroscience has given us about how to improve long-term memory might help educators create lesson plans that instead capitalize on a student's abilities.
- **Emphasizing the importance of emotion in learning.** We know that experience has a profound impact on brain development. Students' learning can be improved, and it can help them retain new information if an emphasis is placed on providing a supportive and engaging learning environment.
- **Challenging us to expand our methods.** Teachers can now design curricula to reach a wide range of kids because to data on brain development that provides insight into how different students learn best. We are aware that not every

	<p>student will respond well to a particular teaching strategy, and that occasionally we may need to diversify our approaches in order to engage with a range of learners.</p> <ul style="list-style-type: none">• Seeing how learning experiences impact the brain. There are numerous instructional applications for the idea of brain plasticity. The brain adjusts to new experiences by responding to them and forming connections between different subjects, such as when learning a new language. Making the most of students' opportunities and knowing when and how to create these experiences are made easier by neuroscience.•• Providing new kinds of feedback. Using each of the concepts above, teachers can improve their capacity to engage children by implementing neuroscience in the classroom. And as a result, learning becomes more significant and durable. <p>”</p> <p>References</p> <ul style="list-style-type: none">• (Hromek & Roffey, 2009)• Blackwell et al.'s (2007)• Bruce & Elizabeth (2020)
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THE FUNDAMENTAL PRINCIPLES OF NEP-2020 & NEUROSCIENCE

(Policy statements are written in italics)

- 1) *“Recognizing, identifying, and fostering the unique capabilities of each student, by sensitizing teachers as well as parents to promote each student’s holistic development in both academic and non-academic spheres”* (NEP-2020)

From a neuroscientific perspective, each brain is unique. NEP's emphasis on unique capabilities of students and individualized instruction acknowledges this fact.

2) ***“The highest priority to achieving Foundational Literacy and Numeracy by all students by Grade 3. Ensuring quality early childhood care and education for all children between 3-6 years; New Curricular and Pedagogical Structure (5+3+3+4)”***

According to neuroscientific findings pace and span of brain development is tethered to developmental phases. The functional and structural capability and potential of the brain at each developmental phase are different. Curriculum and learning activities must be designed according to the receptive level of the student's brain in each developmental phase. For instance, brain plasticity is at its peak during early developmental phases. And there are sensitive periods for acquiring certain social and cognitive skills. NEP as a policy recognizes this as it gives much thrust to ECCE.

3) ***“Flexibility, so that learners can choose their learning trajectories and programmes, and thereby choose their own paths in life according to their talents and interests”.***

Intrinsic motivation thrives only in the learning environment where flexibility, the exercise of choice and autonomy is allowed. Brain pathways sustaining intrinsic motivation are different from those for extrinsic, reward-based motivation. When learning is powered by intrinsic motivation it is highly effective. Flexibility and freedom of choice, being a norm in NEP at all levels of education, respects basic individual inclinations and talents, and allows unique brains to develop their potential in their own way.

4) ***“No hard separations between arts and sciences, between curricular and extra-curricular activities, between vocational and academic streams, etc. in order to eliminate harmful hierarchies among, and silos between different areas of learning. multidisciplinary and a holistic education across the sciences, social sciences, arts, humanities, and sports for a multidisciplinary world in order to ensure the unity and integrity of all knowledge”***

Theories on Brain-Based Learning (e.g. Renate & Caine 1991) says that *“The brain processes parts and wholes simultaneously* implying that the left and the right hemisphere have different functions, but they are designed to work together”. Holistic approaches of NEP do justice to a fundamental nature of neural behaviour-- interconnectedness. Though each region of the brain is specialized for unique purpose/s there is an ineluctable wholeness maintained through interconnectedness which guides all the cognitive, social and emotional functioning of humans. NEP's attempt to eliminate the hard separation between disciplines acknowledges the holistic nature of brain functioning as revealed by 21st-century investigations.

5) ***“Emphasis on conceptual understanding rather than rote learning and learning-for-exams creativity and critical thinking to encourage logical decision-making and innovation”***

The brain searches for meaning. This search for meaning occurs through patterning. New information must fit into the previous memories and experiences. If conceptual formation has not taken place properly, the memory will be slack as the student will be relying on rote learning. Rote learning creates meaningless fragile patterns, which fade soon after the exam. NEP by emphasizing experiential, holistic learning for conceptual formation is doing justice to the fundamental brain principles of memory formation and learning. Learning can be transferred to the level of applicability only if meaningful patterns are formed.

6) ***“Ethics and human & Constitutional values like empathy, respect for others, cleanliness, courtesy, democratic spirit, spirit of service, respect for public property, scientific temper, liberty, responsibility, pluralism, equality, and justice promoting multilingualism and the power of language in teaching and learning”***

These are the main ingredients needed for creating a positive classroom. A classroom where there is enough space for creating these qualities will be a positive classroom and will suffice the conditions needed for priming the students' brains for learning.

7) ***“Focus on regular formative assessment for learning rather than the summative assessment that encourages today's ‘coaching culture.’”***

Formative assessment keeps the momentum of motivation and learning in the right direction. According to findings on the brain, receiving feedback from significant ones for various academic activities incorporates actions of the emotional brain, reward circuit and social brain. Positive feedback is effective in motivating student while negative feedback harms it (Bandura & Cervone, 1983). Formative assessment NEP is designed in a brain-friendly manner, in the sense that it is like a communication between the teacher and student; and teacher and parent about the further steps to be taken to improve learning outcomes. A teacher can make informed decisions and frame positive communication strategies if she is well-trained in neuroscientific principles of teaching and learning.

8) ***“Teachers and faculty as the heart of the learning process – their recruitment, continuous professional development (CPD), positive working environments and service conditions. outstanding research as a corequisite for outstanding education and development”***

NEP-2020 and ITEP have clear guidelines for CPD. NEP's passionate advancement for shaping a teaching community for self-reliant India incorporates the necessity of equipping teachers with knowledge and expertise in a wide range of scientific and artistic subjects, which will surely include brain sciences. NEP always highlight the need for scientific research in all HEI. Accordingly, all teachers in India will stay tuned to research in Brain sciences and it will influence teacher thinking, decision-making and classroom practices. The correspondence and compatibility between the 5+3+3+2 system and the ITEP semester

system show NEP's acknowledgement of the fact that different developmental phases need different learning experiences. For the same reason, the teacher expertise needed for teaching and mentoring students in a particular developmental phase is unique.

9) “A rootedness and pride in India, and its rich, diverse, ancient and modern culture and knowledge systems and traditions”

Nothing is as influential as contemplative culture in shaping a healthy brain. Latest neuroscientific research in yoga, meditation and mindfulness vouches for this. India was a country where contemplative culture dominated in all areas of learning and teaching. Universities like Nalanda and Thakshashila gave us the status of Viswaguru. If we could bring back contemplative approaches into classroom ambience, a positive classroom environment which is an indispensable condition for learning to take place will be a natural consequence.

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PERSPECTIVES OF NEUROCOGNITION IN EDUCATION

Dr. TOMY K. O.

Abstract

Recent findings from the neurocognitive sciences have produced a fast frontier of knowledge on how brain processes, stores, and retrieves information. As educators at all levels have increasingly recognized their role as consumers of this emerging knowledge, translating neuroscience research into instructional practice often becomes a challenge for educational practitioners. Using the latest neural research provide a biologically driven framework for creating effective instruction. As far as learning process is concerned, the functioning of the brain facilitates information processing, restoration and retrieval. The educator should be fully aware of all the brain functions to make their effective teaching. This scientific approach can bridge the neurocognitive knowledge with the instructional goals and aims of education. Research on the neuroscience of learning is providing scientific evidence to support the learning theories that have been used for years. Neurocognitive orientation promotes

Student centered learning that utilizes the whole brain and recognizes that not all students learn in the same way. It is also an active process where students are actively engaged in constructing their own knowledge in a variety of learning situations and contexts

Key Words: Neurocognition, Culture, Mindfulness, Orientation

Introduction

The biological mechanism to enhance the learning process emerged as an innovative discussion in educational neuroscience. The neuroscience research has developed methods to assist instructors as they design learning environments using neuro scientific tools such as brain image technologies to investigate cognitive functions and inform educational practices. Central to educational neuroscience and to its experimental design and methods is accessing real-time information about the brain that could shed light on cognitive functions, as defined by elements pertaining to learning such as the following: attention, memory, language, speech, emotion, consciousness, and other higher cognitive functions (Gazzaniga, 2004). New and ongoing findings from the neurocognitive sciences have produced a fast frontier of knowledge on how brain processes, stores, and retrieves information. As educators at all levels have increasingly recognized their role as consumers of this emerging knowledge, translating neuroscience research into instructional practice often

becomes a challenge for educational practitioners. Using the latest neural research provide a biologically driven framework for creating effective instruction. As far as learning process is concerned, the functioning of the brain facilitates information processing, restoration and retrieval. The educator should be fully aware of all the brain functions to make their effective teaching. This scientific approach can bridge the neurocognitive knowledge with the instructional goals and aims of education.

Neurocognition

Neurocognition is any form of cognition that is associated with the functioning of one or more specific areas of the brain (wiktionary definition). Neurocognitive functions are cognitive functions closely linked to the function of particular areas, neural pathways, or cortical networks in the brain substrate layers of neurological matrix at the cellular molecular level. Neurocognition includes perceiving, recognizing, conceiving, judging and reasoning processes. Neurocognitive process includes a number of human functions through neuronal net work, such as Neuronal Representation, Registration, Retrieval– STM, Frontal Cortex Content evaluation, amygdala emotional evaluation, Neocortex sensory association, thalamus neuronal network communication and sensory stimuli crude sensation (Stephen M. Stahl2006). The cognitive processes are based on a number of core cognitive skills, which when developed and enhanced can dramatically improve one's ability to process information effectively. The neurocognitive orientation helps to locate the sensory environment to which the learner is exposed in order to encourage the regions of the brain, which are responsible for processing the sensory stimuli to re-tune and to process information more normally. The brain takes in information from the sensory environment, through the eyes, ears, nose, mouth and skin. Specific areas are responsible for processing this information and then re-routing it to the appropriate part of the cortex for further attention, evaluation and action (N. Sasikumar, M.Parimala Fathima and S.Mohan 2014). Neurocognitive Processing to simultaneously treat both systems resulting in a more attentive, focused mind. Preexisting neuro pathways are strengthened through the neurocognitive activation and can improve attention, processing speed, memory, hand-eye coordination, visual discrimination, executive function, visual memory, auditory discrimination, and auditory comprehension.

Important Determinants of Neurocognition

The important determinants of neurocognition are genetics, development, experience, culture, environment, emotions and socioeconomic status

Genetics

The orientation about the Neurocognition and the genetic determinants is very important to provide a meaningful educational environment to the child. Several measures of brain morphometry are under strong genetic control, including regional gray and white matter volumes (Hulshoff Pol et al., 2006) and cortical thickness (Schmitt et al., 2008a,b; Lenroot et al., 2009) and the same set of genes influences both IQ and gray/white matter volumes (Posthuma et al., 2002). Genes determine the onset of pruning. Transactional models predict that people in high-opportunity contexts actively evoke and select positive learning experiences on the basis of their genetic predispositions (Elliot M. Tucker-Drob, Daniel A. Briley, K. Paige Harden, 2013). Current studies in the developmental neuroscience field continue to advance in the understanding of the mechanisms through which experience and environmental influences interact with genes, especially with DNA biochemical markers and histone proteins that regulate gene activity, which could be modified by early experience. Post-translational modifications of histones and DNA methylation are the most frequently analysed mechanisms, which are involved in interactions between gene activity changes and environmental factors, such as neurotoxin, nutrition and regulation of stress (Roth & Sweatt, 2011; Zhang & Meany (2010)). The brain architecture was under strong genetic control. White matter integrity was linked with intellectual performance, especially with performance IQ; this linkage was found to be primarily mediated by common genetic influences (Ming-Chang Chiang,¹ Marina Barysheva,¹ David W. Shattuck,¹ Agatha D. Lee,¹ Sarah K. Madsen,¹ Christina Avedissian,¹ Andrea D. Klunder,¹ Arthur W. Toga,¹ Katie L. McMahon,² Greig I. de Zubicaray,² Margaret J. Wright,³ Anuj Srivastava,⁴ Nikolay Balov,⁴ and Paul M. Thompson¹, 2009).

Development

The orientation about the Neurocognitive development also is very important to provide a meaningful educational environment to the child. Childhood, adolescence and even young adulthood are periods of ongoing structural brain development and concurrent improvements in many cognitive functions (Christian Krog Tamnes 2010). The total volume of the brain rapidly increases throughout the first years of life and then stays relatively stable. By the age of 6 years, the total size of the brain has been estimated to be approximately 90% of its adult size (Giedd, 2004; Reiss, Abrams, Singer, Ross, & Denckla, 1996). In a seminal paper, Shaw et al. (2006) demonstrated that the structural maturation of cerebral cortex

is related to general intellectual abilities. The results suggested that children at different levels of intellectual abilities had different maturational trajectories of cortical thickness, primarily in frontal regions. More specifically, children with high intelligence scores were characterized by an accelerated and prolonged phase of increase in cortical thickness, as well as a more rapid cortical thinning in adolescence. Sowell et al. (2004) found that gain in verbal intelligence was correlated with cortical thinning in the left hemisphere in lateral dorsofrontal and lateral parietal regions, while a similar expected right hemisphere association with gain in performance intelligence was not found. Intellectual abilities are likely supported by multiple interconnected cortical regions, and a reasonable assumption is thus that the integrity of the connecting fibers is important. Throughout early neurodevelopment, myelination helps provide the foundation for brain connectivity and supports the emergence of cognitive and behavioural functioning. Early life nutrition is an important and modifiable factor that can shape myelination and, consequently, cognitive outcomes. Differences in the nutritional composition between human breast and formula milk may help explain the functional and cognitive disparity often observed between exclusively breast versus formula-fed children. Prolonged and exclusive breastfeeding plays an important role in early neurodevelopment and childhood cognitive outcomes (Sean Deoni , Douglas Dean III, Sarah Joelson, Jonathan O'Regan, Nora Schneider, 2017). The trajectories of typical and atypical neurocognitive development in disparate socioeconomic contexts generate different degrees of brain plasticity (Gianaros & Manuck, 2010). Access to adequate nutrition from prenatal stage encourages emotional and intellectual development in different contexts, such as home and school. It further promotes full social and educational inclusion, and comprises different aspects such as basic human rights, which have been considered by different disciplines. Increases in myelination and larger axonal diameter have been associated with increased neuronal conduction speed and may support better cognitive function (Aboitiz, 1992; Jung and Haier, 2007).

Neurocognition and experience

Experience plays a decisive role in neurocognitive development. The physical brain is literally shaped by experience; axonal circuits change, modify, and redevelop as human's age. The human brain actually maintains an amazing plasticity throughout life. We can literally grow new neural connections with stimulation, even as we age. This fact means nearly any learner can increase their intelligence, without limits, using proper enrichment" (Jensen, 2000). According to Lackney, pruning occurs even in children,

and research has shown that axons continue to grow throughout life. Learning is also due to input to the brain. Sensory information (e.g., aural, visual, and tactile information) enters the brain along multiple nerve receptors. Neuronal growth, which is initiated by learning, explains scientifically what happens with assimilation and accommodation. The terms assimilation and accommodation are associated with cognitive learning theory. In assimilation, incoming information is changed to fit into existing knowledge structures (i.e., neuronal structures that already exist) (Ally, 2004). Accommodation occurs when an existing cognitive structure (i.e., current neuronal circuits) is changed to incorporate new information (Ally, 2004).

Culture

Neurocognitive functions, such as attention/executive functions, language, memory/learning, sensorimotor functions, social perception, and visuospatial processing, gradually develop as a child grows. This happens following brain maturation, but also in close relationships with the environment and background of the child. The role of culture proved to be a vital role in neurocognition through educational neuroscience research. The individual can only fully understand information if it is meaningful, the individual will respond to events in ways that have been influenced by culture as well as personal experiences. This factor need to be considered in order to understand how an individual perceives and interprets incoming information. Neurocognitive functions, such as attention/executive functions, language, memory/learning, sensorimotor functions, social perception, and visuospatial processing, gradually develop not only because of brain maturation, but also in close relationships with the environment and background of the child (SEBASTIÁN J. LIPINA1)(<http://www.casinapioiv.va/content/dam/accademia/pdf/sv125/sv125-lipina.pdf>).

Environment

Environmental factors dynamically influence the Neurocognitive development (Jensen, 2000). Educational neuroscience approach applies to the analysis of how different rearing environments modulate the brain structure and function at molecular, genetic, cellular, network, individual and social behaviour levels (Mohammed et al., 2002; Pang & Hannan, 2013; Sale et al., 2009; Simpson&Kelly, 2011). <https://pdfs.semanticscholar.org/c725/85a5aa204b39e1493665e89cb5d9ea0445b0.pdf>). The environment in which the brain operates determines to a large degree the functional ability of the brain” (Roberts,

2002). Today's classrooms are often not meeting optimal learning conditions. The student is better able to control his or her environment when the student is relaxed in a familiar environment, learning may be enhanced. The instructor should inform students about how to make their environments optimal for learning. Color, hydration, visual stimuli, psychological stimuli, seasons, temperatures, plants, music, noise, and aromas can all influence learning. Audio visual enrichment will enhance learning. At the level of imaging studies, evidence exists that the brain may adapt dynamically to reflect environmental cognitive demands. For instance, neuroimaging studies evidence structural changes in specific areas after training in difficult motor tasks, such as the increased activation of motor, auditory and visual-spatial brain areas and white matter tracts as well, in professional musicians (Gaser & Schlaug, 2003; Imfeld et al., 2009). "Enriched and challenging environments produce more neural connections while boring and sterile ones these connections to whither and die." (Diamond & Hobson, 1998).

Emotions

According to Jensen (2000), emotions are drivers for learning. All learning involves our body, emotions, attitudes, and physical well being. If students are forced into survival mode, learning will not occur. Neuropsychological models of behavior suggest that children's neurological functioning affect the regulation of strong emotions, as well as performance in social, cognitive, and behavioral spheres. The amygdala is responsible for our emotions, and is concerned with survival and emotional interpretation of situations. It is responsible for bringing emotional content into memory, and plays a major role in learning. It is important to recognize and acknowledge the feelings and emotions that students may have. The instructor should provide personal, meaningful projects, and greater individual choice while eliminating threats, high stress, and artificial deadlines and should ensure that the resources students might need are available. It is the emotion behind the students' goals that provides the energy to accomplish them (Jensen, 2000). Although the current evidence base suggests that children with high levels of callous-unemotional traits are genetically and neurologically vulnerable to developing psychopathic and antisocial behaviors, existing research also clearly indicates that environmental influences play an important role. One potential implication is that interventions for children with antisocial behavior and callous-unemotional traits may need to be tailored to take into account their distinct pattern of neurocognitive vulnerability, as revealed by developmental neuroimaging studies. Specifically, interventions that pursue punishment-oriented or explicit

empathy induction strategies may be less effective with this group of antisocial children. By contrast, preliminary evidence suggests that enhancing positive parenting and parental involvement, as well as applying consistent rewards may represent more promising intervention approaches (David J. Bridgett, Nicole M. Burt, and Erin S. Edwards,2015). Emotions are entwined in neural connections, and emotion and cognition cannot be separated. Emotion is crucial to the storage and retrieval of information.

Socioeconomic Status

Childhood socioeconomic status (SES) is strongly associated with later cognitive development and academic achievement (Bradley, Corwyn, Burchinal, McAdoo, & Garcia Coll, 2001; Brooks-Gunn & Duncan, 1997; Evans, 2004; Hoff, 2003; McLoyd, 1998). By the time of school entry, children from lower SES backgrounds typically score between one-half and one full standard deviation lower than other children on most academic achievement tests (Rouse, Brooks-Gunn, & McLanahan, 2005). Socioeconomic status (SES) is strongly associated with cognition and achievement. Socioeconomic disparities in language and memory skills have been reported from elementary school through adolescence. The home language and literacy environment and parental warmth partially accounted for disparities in language, but not memory development (Kimberly G. Noble^{1,2} Laura E. Engelhardt³ Natalie H. Brito⁴ Luke J. Mack⁶ Elizabeth J. Nail⁵ Jyoti Angal⁶ Rachel Barr⁷ William P. Fifer⁸ Amy J. Elliott⁶2016). Socioeconomic status (SES) has been linked to functioning across a variety of neurocognitive domains including language, memory, executive functioning, and social-emotional processing. We review these findings and discuss the ways in which socioeconomic context may shape neural processes such that these skills are supported by different neurobiological pathways in children from lower versus higher SES backgrounds (ALEXANDRA URSACHE AND KIMBERLY G. NOBLE,2015). Parental SES was related to white matter integrity and volume in multiple tracts. Additionally, SES was found to moderate the relation between white matter structure and cognitive flexibility. These results suggest that children from higher income families may be buffered from behavioral deficits that are typically associated with lower white matter volume and integrity. As such, this work adds to a growing body of literature suggesting that the socioeconomic contexts in which children develop not only shape cognitive functioning and its underlying neurobiology, but may also shape the relations between brain and behavior (Alexandra Ursache,Kimberly G. Noble,2916).However, neurocognitive performance also reflects influences of the background of the child. For instance,

socioeconomic factors and parental education level are related to performance on a variety of neurocognitive tasks (Johanna Rosenqvist,2017).

CONCLUSION

Human being's learning processes is unique and the early identification of individual differences in the class room related to the various determinants of neurocognition are important to assess the child's strengths and difficulties. According to Fishback (1999), "the creation of neural networks and synapses constitute learning". There are billions of neurons, and the number of synapses is more than 10,000 times the number of neurons (Hill, 2001). "A single neuron can have from a few thousand up to one hundred thousand synapses, and each synapse can receive information from thousands of other neurons. The resulting 100 trillion synapses make possible the complex cognition of human learning" (Hill, 2001). "Unless connections are made to students' prior learning, comprehension and meaning may be dramatically lessened. An instructor guides students in thinking through problems and making connections. Neuroscience research based pedagogy is found to be effective in influencing the achievement level of children in learning and the awareness about the relationship between the neurocognitive functions and learning process will enhance the metacognitive ability of the learner and the educator. This allows students to form the correct "connections prior to reinforcing connections between new and old information incorporated within existing knowledge structures" (Forrester & Jantzie, n.d., n.p.). Distance learning and multimedia present new challenges to today's instructors. Instructors who learned in traditional, passive classrooms need to learn new skills and ways of teaching. Today's instructors must also cope with developing new neural networks as they relate new methods of instruction to the old. Implications for Preparing the Learner Preexposure and scaffolding are important methods of preparing students for learning. Adults need to connect new information with old information. As they do this, their neural pathways change to connect new information to the older pathways already developed in the brain. Neural circuits continue to grow, even with age. Neuronal growth, which is initiated by learning, explains scientifically what happens with assimilation and accommodation. The terms assimilation and accommodation are associated with cognitive learning theory. In assimilation, incoming information is changed to fit into existing knowledge structures (i.e., neuronal structures that already exist) (Ally, 2004). Accommodation occurs when an existing cognitive structure (i.e., current neuronal circuits) is changed to incorporate new information (Ally, 2004). Research on the neuroscience of learning is providing

scientific evidence to support the learning theories that have been used for years. Equality of educational opportunity is not meaningful to most of the students, until and unless the present education system give importance to the cognitive orientation to the educators. The awareness about the important determinants will enhance the teaching and learning environment in the class room. While designing the instructional strategies, the biological process of learning should consider with equal importance. The integration of scientific knowledge in educational neuroscience also is an important input to the advancement of education. “Emotions drive attention which drives learning, memory, and just about everything else” (Sylwester, 1995).

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The Significance of Mindfulness Education for Tamil Linguistic Minority Students: Strategies for Developing Mindfulness Practices.

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Abstract:

This paper emphasizes the vital role of mindfulness education in enhancing the well-being and academic performance of Tamil linguistic minority students. It explores the unique challenges faced by this student population and highlights the importance of implementing mindful education strategies tailored to their cultural and linguistic backgrounds. This paper explores the advantages of mindfulness practices, like enhanced attention and stress reduction, and emphasizes the importance of positive teacher-student relationships and a supportive classroom environment. It also highlights the need for tailored mindfulness programs for secondary level Tamil linguistic minority students, stressing the significance of teacher training and practice adaptation. By offering insights into mindfulness education for this demographic, the paper aims to assist educators, policymakers, and researchers in enhancing their well-being and academic achievement.

Keywords: *Mindfulness education, Tamil linguistic minority students, Cultural adaptation, Teacher-student relationships, Classroom climate.*

Introduction:

In contemporary educational discourse, the pursuit of holistic student development has transcended the mere acquisition of academic knowledge and skills. Instead, there is a growing recognition of the profound interplay between students' well-being and their academic performance. In this context, the significance of mindfulness education emerges as a beacon of hope, particularly for Tamil linguistic minority students navigating the complexities of the educational landscape.

The Tamil linguistic minority students represent a vibrant and diverse community within the educational experience, yet they often encounter unique challenges stemming from linguistic and cultural barriers. These challenges, ranging from language assimilation pressures to socio-economic disparities, can significantly impact their educational journey and overall well-being. Recognizing these hurdles is crucial in devising effective strategies to support their academic success and cultivate their holistic development.

As Professor Jon Kabat-Zinn, a pioneer in the field of mindfulness, aptly puts it, "Mindfulness is about being fully awake in our lives. It is about perceiving the exquisite vividness of each moment" (Kabat-Zinn, 1994). This sentiment underscores the essence of mindful education, which goes beyond rote learning to foster a deep sense of presence and awareness among students, regardless of their cultural or linguistic background.

This paper embarks on a journey to illuminate the vital role of mindfulness education in addressing the multifaceted needs of Tamil linguistic minority students. It delves into the intricacies of their socio-cultural context, unpacking the layers of challenges they face within educational settings. By acknowledging the significance of cultural and linguistic backgrounds, this paper advocates for the implementation of tailored mindful education strategies that resonate with the lived experiences of these students.

At its core, mindfulness education encompasses a holistic approach that nurtures students' cognitive, emotional, and social well-being. Drawing upon the words of Dr. Daniel Siegel, a renowned psychiatrist and expert in interpersonal neurobiology, "Mindfulness is simply about noticing what is happening in the present

moment without judgment and with curiosity" (Siegel, 2007). Through the cultivation of mindfulness practices, such as focused attention and stress reduction techniques, students can develop the inner resources necessary to navigate academic challenges and cultivate resilience in the face of adversity. Mindful education emphasizes the cultivation of positive teacher-student relationships and the creation of a supportive classroom climate, which are indispensable factors in fostering a conducive learning environment for Tamil linguistic minority students.

Drawing upon empirical evidence and theoretical frameworks, this paper endeavors to elucidate the advantages of mindfulness practices in enhancing the well-being and academic performance of Tamil linguistic minority students. Research by Holzel et al. (2011) highlights the positive impact of mindfulness meditation on brain structure and function, underscoring its potential to enhance attention, emotional regulation, and overall well-being among students.

Studies by Black et al. (2013) and Napoli et al. (2005) emphasize the importance of mindfulness interventions in reducing stress and improving academic outcomes among students. It underscores the need for tailored mindfulness programs specifically designed for secondary level students within this demographic. Central to the successful implementation of such programs is the provision of adequate teacher training and the adaptation of mindfulness practices to suit the cultural and linguistic nuances of Tamil linguistic minority students.

By offering comprehensive insights into the realm of mindfulness education for Tamil linguistic minority students, this paper aspires to serve as a guiding beacon for educators, policymakers, and researchers alike. It is through collaborative efforts and informed practices that we can collectively strive towards the noble endeavor of enhancing the well-being and academic achievement of all students, regardless of their linguistic or cultural background.

Mindful Education for Tamil Linguistic Minority Students

In recent years, the concept of mindfulness education has gained prominence as a means of promoting holistic development among students. Mindful education integrates mindfulness practices into the academic curriculum to enhance students' well-being, emotional regulation, and cognitive functioning. Its relevance extends to diverse student populations, including Tamil linguistic minority students, who face unique challenges in the educational landscape. The introduction of mindful education for Tamil linguistic minority students signifies a recognition of the need to address their specific cultural and linguistic backgrounds to foster their academic success and overall flourishing.

Tamil linguistic minority students encounter a myriad of challenges that significantly impact their educational journey. Language barriers pose a significant obstacle, as these students may struggle to comprehend instructional materials delivered in languages other than their native Tamil. Moreover, cultural differences between Tamil linguistic minority students and their peers can lead to feelings of isolation and alienation within the school environment. This sense of cultural disconnection can affect their motivation, engagement, and sense of belonging in the classroom.

Furthermore, Tamil linguistic minority students may face social stigma and discrimination, both within and outside of the educational context. Negative stereotypes and biases based on their linguistic or ethnic background can undermine their self-esteem and confidence, hindering their academic performance and overall well-being. Additionally, limited access to resources and support services tailored to their linguistic and cultural needs further exacerbates the challenges faced by Tamil linguistic minority students, perpetuating educational inequities.

These multifaceted challenges underscore the importance of adopting a culturally responsive approach to education for Tamil linguistic minority students. By acknowledging and addressing the barriers they encounter, educators and policymakers can create more inclusive and supportive learning environments that empower these students to thrive academically and personally. Mindful education offers a promising framework for addressing the needs of Tamil linguistic minority students by promoting self-awareness, resilience, and cultural competence among educators and students alike.

The educational experiences of Tamil linguistic minority students may be influenced by broader societal attitudes and policies that marginalize minority communities. Discriminatory practices in housing, employment, and access to social services can create additional stressors and barriers for these students, affecting their mental health and academic performance. Addressing these systemic inequities requires a multifaceted approach that addresses both individual and structural factors, emphasizing the importance of advocacy, community engagement, and policy reforms to create a more equitable educational landscape for Tamil linguistic minority students.

Advantages of Mindfulness Practices:

Incorporating mindfulness practices into the education of Tamil linguistic minority students offers numerous benefits that contribute to their overall well-being and academic success. One significant advantage is the improvement in attention and concentration. Mindfulness techniques, such as focused breathing exercises and mindfulness awareness of sensations, help students develop the ability to sustain their attention on academic tasks despite distractions, thereby enhancing their learning experience and academic performance.

Mindfulness practices facilitate stress reduction and emotional regulation among Tamil linguistic minority students. By learning to cultivate present-moment awareness and non-judgmental acceptance of their thoughts and emotions, students can better manage stress, anxiety, and negative emotions that may arise due to academic pressures or social challenges. This enhanced emotional resilience enables students to navigate difficult situations with greater ease, promoting a positive school climate and fostering a sense of well-being among both students and educators.

Mindfulness practices promote a deeper sense of self-awareness and empathy among Tamil linguistic minority students, fostering positive interpersonal relationships and conflict resolution skills. By cultivating an understanding of their own emotions and perspectives, students become more attuned to the experiences of others, leading to greater empathy and compassion in their interactions with peers and teachers. This

fosters a supportive and inclusive classroom environment where students feel valued, respected, and understood, enhancing their sense of belonging and academic engagement.

Fostering positive teacher-student relationships and creating a supportive classroom environment is essential for maximizing the effectiveness of mindfulness education strategies among Tamil linguistic minority students. Research has consistently shown that strong, positive relationships between teachers and students are associated with improved academic outcomes, increased motivation, and enhanced socio-emotional development. For Tamil linguistic minority students, who may already face challenges related to cultural and linguistic differences, supportive relationships with teachers serve as a crucial source of encouragement, guidance, and validation.

Nurturing classroom environment characterized by trust, respect, and inclusivity provides a foundation for effective mindfulness practice. When students feel safe and supported in their learning environment, they are more likely to engage fully in mindfulness activities and integrate these practices into their daily lives. Teachers play a pivotal role in creating such an environment by modeling mindfulness skills, providing opportunities for reflection and discussion, and responding empathetically to students' needs and experiences. By prioritizing positive teacher-student relationships and cultivating a supportive classroom climate, educators can optimize the benefits of mindfulness practices for Tamil linguistic minority students.

Need for Tailored Mindfulness Programs:

The development of tailored mindfulness programs specifically for secondary level Tamil linguistic minority students is imperative to ensure the relevance and effectiveness of these practices in addressing their unique needs and challenges. While mindfulness interventions have demonstrated benefits across diverse populations, it is essential to consider cultural factors, language preferences, and socio-economic backgrounds when designing and implementing these programs for Tamil linguistic minority students.

Adequate teacher training is essential to equip educators with the knowledge and skills necessary to facilitate mindfulness practices in culturally sensitive and linguistically appropriate ways. This includes

understanding the cultural norms and values of Tamil linguistic minority communities, integrating culturally relevant content and practices into mindfulness curriculum, and fostering an inclusive learning environment that respects students' diverse backgrounds and experiences.

Mindfulness programs for Tamil linguistic minority students should be tailored to address the specific stressors and concerns they may face, such as acculturation stress, discrimination, and language barriers. By incorporating strategies for coping with these challenges into mindfulness training, educators can empower students to navigate their academic and personal lives with greater resilience and well-being. Additionally, ongoing evaluation and adaptation of mindfulness programs based on feedback from students, teachers, and community stakeholders are essential to ensure their relevance and effectiveness in supporting the holistic development of Tamil linguistic minority students.

Conclusion:

In conclusion, the implementation of mindfulness education strategies tailored to the needs of Tamil linguistic minority students holds immense promise for promoting their well-being and academic success. By acknowledging and addressing the unique challenges faced by this student population, educators and policymakers can create more inclusive and supportive learning environments that empower Tamil linguistic minority students to thrive. The integration of mindfulness practices into the educational curriculum offers a holistic approach to addressing the cognitive, emotional, and social needs of these students, enhancing their overall educational experience.

The advantages of mindfulness practices, including improved attention, stress reduction, and emotional regulation, are particularly beneficial for Tamil linguistic minority students who may navigate multiple stressors related to language barriers, cultural differences, and social stigma. By equipping students with mindfulness skills, educators empower them to cultivate resilience, self-awareness, and empathy, thereby fostering positive interpersonal relationships and enhancing their sense of belonging within the school community.

Fostering positive teacher-student relationships and creating a supportive classroom environment are essential components of effective mindful education for Tamil linguistic minority students. When teachers prioritize building trust, respect, and inclusivity in their interactions with students, they create a foundation for meaningful engagement in mindfulness practices and academic learning. These relationships serve as a source of encouragement and support, enabling students to navigate challenges with confidence and perseverance.

Moreover, the need for tailored mindfulness programs specifically designed for secondary level Tamil linguistic minority students cannot be overstated. By incorporating culturally relevant content, language accommodations, and strategies for addressing socio-economic disparities, educators can ensure the relevance and effectiveness of mindfulness interventions for this student demographic. Additionally, ongoing teacher training and program evaluation are essential to continuously refine and improve mindfulness practices to meet the evolving needs of Tamil linguistic minority students.

Mindful education offers a transformative approach to supporting the holistic development of Tamil linguistic minority students, enhancing their well-being, academic achievement, and socio-emotional growth. By embracing mindfulness as a tool for fostering self-awareness, resilience, and cultural competence, educators and policymakers can contribute to creating more equitable and inclusive educational opportunities for all students, regardless of linguistic or cultural background. Through collaborative efforts and a commitment to cultural responsiveness, we can empower Tamil linguistic minority students to realize their full potential and become active participants in shaping their future and contributing to the broader community.

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PERSONALITY OF STUDENT TEACHERS AT SECONDARY LEVEL

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INTRODUCTION

Hans Eysenck was one of the most influential thinkers of the twentieth century. His goal was to combine the greatest experimental psychology theories and practises with the finest individual differences measurement methodologies. He left a legacy of extensive and rigorous study, from his initial investigations of the dimensions of individual differences, through several repetitions at theory building, to his lasting successes in constructing a paradigm for personality study. He devised a model that required all the traits that he thought existing and then a test to determine where a person filled within these. The test was called the EPI-Eysenck 's personality inventory. Eysenck grouped traits in to definite types. Hence, we can say that his approach is 'trait cum type' approach. Eysenck considered type as a group of correlated traits resulting in a specific pattern of behavioural style typical of the personality of an individual. On the basis of such patterns, he has identified various types of personality such as Introvert-Extrovert, Neurotic- Stable, and Psychotic-normal. Or we can say that Extroversion (E), Neurotic (N), Psychotic (P) and social desirability scale (L). Eysenck theory is based primarily on physiology and genetics. Although he was a behaviourist who considered learned habits of great importance, he believed that personality differences grow out of own genetic inherence. He is therefore primarily interested in what is usually called temperament. Extroversion is defined as the quality of being out going and directing attention to things other than yourself. When a person likes going out all the time and being the centre of attraction. This is an example of extroversion and introvert persons are always inward turning, or focused more on internal thoughts, feeling and moods rather than seeking out external stimulation. Neurotism is characterised by high levels of negative effects such as depression, theory activation thresholds in the symmetric nervous system or visual brain. Neurotic people who have low activation thresholds and unable to inhibit or control their emotional reactions. Emotionally stable people who have high activation thresholds and good emotional control. Psychotism is defined by Eysenck as a personality type that is prove to take risks, might engage in any social behaviours and impulsiveness or we can say that Psychoticism is a personality pattern typified by aggressiveness and interpersonal hostility.

NEED AND SIGNIFICANCE OF THE STUDY

Eysenck personality inventory is an important tool to understand the personality dimensions of students. Especially among B.Ed. student teachers. Because teaching learning is an active process. In this particular job the student teacher should be mentally and physically fit enough to make themselves as models. In order to make classroom lively and the students active, a teacher should act as many roles within the time. Each person may have different traits like Psychotic, Neurotic, extrovert, and introvert. These may have different behaviours and this may affect the behaviour of the students. So, it is very important to find out the trait of each student teacher.

Teaching learning is an active process. So, every student teacher should be very active and energetic in his teaching and learning process. Every student teacher should provide variety of experiences to make classroom learning very interesting and lively. For this the teacher educators should identify the personality traits of each student teacher in order to make this profession a valuable one. Psychotic, neurotic and introvert person should need proper guidance and clinical attention. So, through this study we can hope that we can identify the personality of each student teacher and identify the behavioural problems, and also to given initial measures.

OBJECTIVES OF THE STUDY

- To analyse the personality of student teachers at secondary level.
- To study the personality of student teachers among different optional subjects.

REASERCH QUESTIONS

- Do their student teachers in secondary level differ in their personality dimensions?
- Do there exist a difference in personality among student teachers at secondary level of different optional subjects?

METHOD ADOPTED FOR STUDY

The study was undertaken in privet B.Ed. College in wayanad district of kerala. Out of 100 student teachers 50 student teachers are selected.

SAMPLING PROCEDURE

The study was conducted in first year student teachers of a B.Ed. College in wayand district to gathering the necessary information regarding the researchers' topic. For selecting the sample Purposive sampling was adopted.

TOOLS USED IN THE STUDY

To gather data the researchers used Eysenck's personality inventory or questionnaire.

DATA ANALYSIS

The data collected though questionnaire were analysed manually. The statistical techniques used are simple arithmetic. The interpretation of the data in the context of the objectives of the study.

MAGER FINDINGS OF THE STUDY

Analysis of the scores obtained through achievement in Psychology is presented in the table given below.

Measure	Value
Number	112
Minimum	46.00
Maximum	86.00
Mean	71.7143
Standard Error of Mean	1.06297
Median	73.0000
Mode	66.00
Standard Deviation	11.24937
Skewness	-.563
Kurtosis	-.531

Table 1

The table.1 indicates that the mean value is 71.7143. The minimum score obtained is 46.00 and the maximum is 86.00.. The standard error of the mean is 1.06297. The median is 73.0000. It indicates 50% of the English teachers having 71.71 % of Achievement in psychology.

The Standard Deviation of the score is 11.24937. The Skewness is -0.563. It shows that the distribution of the score is slightly skewed towards the negative side. It means maximum number of individuals have scored above average score. The kurtosis is -0.531, which indicates the platykurtic curve. In other words, the distribution is heterogeneous. This also can be observed from the Figure 1.

1. There is a significant difference in personality dimensions between student teachers at secondary level.

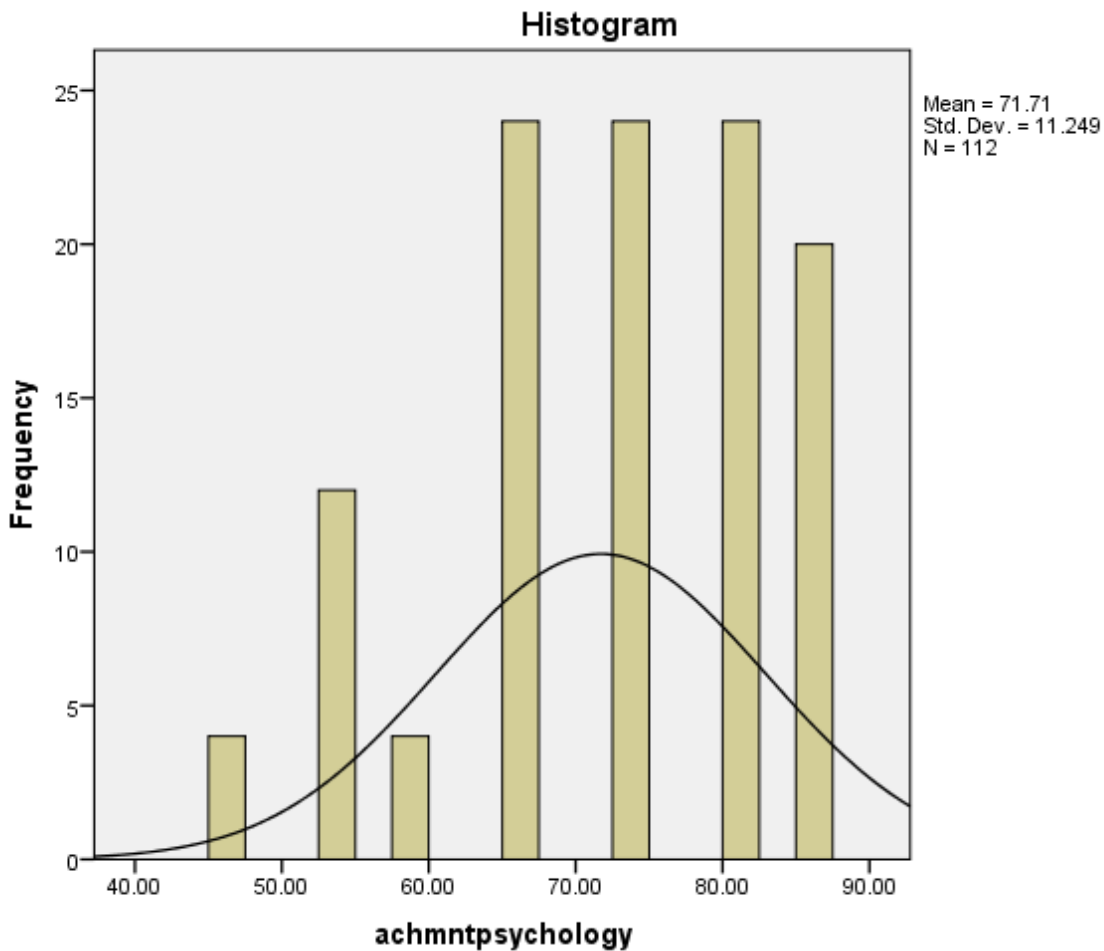
To find out the difference percentage analysis was done. The result in the table given below.

Personality Trait	Number of Students	Percentage
Extrovert	56	50%
Psychotic	14	13%
Neurotic	42	37%

Table 2

“From the above table it is clear that 56 student teachers come under extroversion that means 50% of the student teachers are placed in extroversion trait of personality. 42 student teachers come under neurotic that means 37% of the student teachers are placed in neurotic and 14 student teachers come under introvert trait of personality that means 13% of the student teachers are placed in Psychotic trait of personality.”

Figure 1: Distribution of scores obtained through Achievement in Psychology



2. There is a significant difference among Student teachers of different optional subjects with regard to their achievement in Psychology.

To test the above hypothesis the one-way Analysis of Variance (ANOVA) was used. The summary of ANOVA table is shown below.

Table 3: ANOVA table for Achievement in Psychology and optional subject

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	Sum Squares	of DF	Mean Square	F value
Between Groups	1012.542	3	337.514	
Within Groups	13034.315	108	120.688	2.797*
Total	14046.857	111		

Table 3

*- significant at 0.01 level

The findings of ANOVA in above table reveal that the F-value was found to be significant at 0.01 level of significance.

This clearly confirms that Student teachers of different optional subjects do differ significantly with regard to achievement in psychology.

Therefore, it can be ascertained that the student teachers of different optional subjects has significant impact on their achievement in psychology. Therefore, the null hypothesis is rejected.

To find out the level of difference among four optional subject groups, Scheffe Post Hoc Analysis was carried out the result of the same is given below.

Multiple Comparisons

Dependent Variable: Achievement Psychology
Scheffe

(I) subject	subject (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-2.06667	3.32612	.943	-11.5131	7.3798
	3.00	-1.16667	3.17133	.987	-10.1735	7.8402
	4.00	-7.03030	2.78776	.102	-14.9478	.8872
2.00	1.00	2.06667	3.32612	.943	-7.3798	11.5131
	3.00	.90000	3.32612	.995	-8.5465	10.3465
	4.00	-4.96364	2.96265	.426	-13.3778	3.4505
3.00	1.00	1.16667	3.17133	.987	-7.8402	10.1735
	2.00	-.90000	3.32612	.995	-10.3465	8.5465
	4.00	-5.86364	2.78776	.226	-13.7811	2.0538
4.00	1.00	7.03030	2.78776	.102	-.8872	14.9478
	2.00	4.96364	2.96265	.426	-3.4505	13.3778
	3.00	5.86364	2.78776	.226	-2.0538	13.7811

Table.3.2: Showing the Scheffe for stress management dimension of Emotional Intelligence and experience

Achievement Psychology

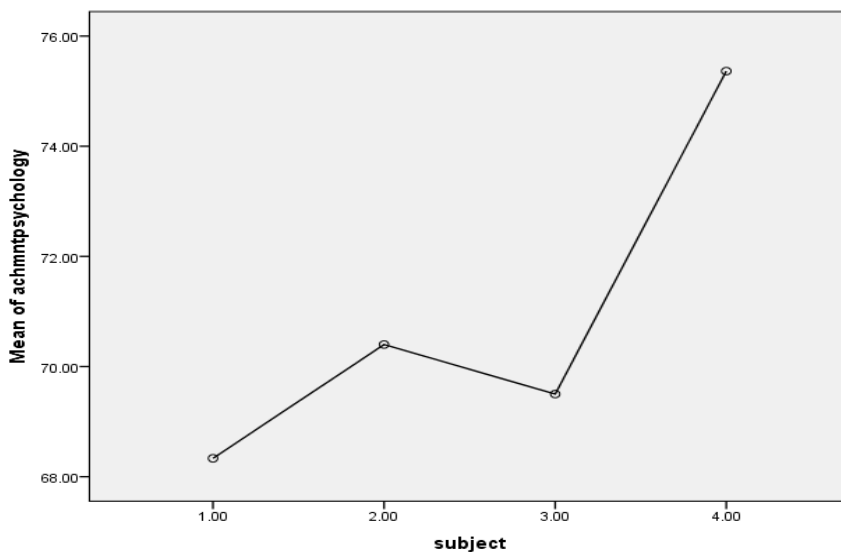
Scheffe Subject	N	Subset for alpha = 0.05
		1
1.00	24	68.3333
3.00	24	69.5000
2.00	20	70.4000
4.00	44	75.3636
Sig.		.161

Table 3.2
Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 25.631.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

“The result of Scheffe Post Hoc Analysis confirms that the Physical science student teachers possess high achievement in Psychology than that of the other three groups. The social science student teachers have low achievement in Psychology. Thus optional subject has a major role in achievement in Psychology. The Physical science student teachers are reported with high achievement in Psychology. This can be observed from the mean plot figure given below”

Figure.2: Mean Plot of Achievement in Psychology and optional subject



1 - Social Science 2 - Mathematics 3 - English 4 - Physical Scienc

EDUCATIONAL IMPLICATIONS OF THE STUDY

- The findings of the present study have certain significant educational implications. Somof them are presented below:
- It gives proper understanding about the importance of doing Personality tests and inventories in educational institutions.
- Helps to understand the personality traits of student teachers of secondary level and to give proper guidance for Psychotic, neurotic and introvert persons.
- Helps for proper planning on different strategies and approaches of teaching on the basis of personality traits of student teachers.

- Providing training programmes on different psychological tests and their administration procedures to all teacher educators will help to give awareness about different psychological tests which is useful for understanding their students' personality traits.

SIGNIFICANCE FOR FURTHER RESEARCH

1. This study is restricted in one B.Ed college in the district. The same study may be extended to other B.Ed colleges in the district.
2. This study is confined to 1st year student teachers. The same study may be extended to all student teachers from I st & II nd year.
3. The present study is conducted on four options like Physical science,
4. English, Mathematics and Social science. The same study may be extended to other options also.
5. A similar study may be done in D.Ed and DL.Ed colleges in the district.
6. A similar study may be done in RIEs.
7. A similar study may be extended to D.Ed and DL.Ed colleges of all districts

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