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Psychological Dimensions of Inclusive Mathematics Learning and Employability

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Abstract:

The National Education Policy (NEP) 2020 emphasizes holistic development, competency-based learning, reduced curriculum overload, experiential pedagogy, and the integration of employability skills from the school level. The findings of this study directly support NEP 2020's vision by highlighting how psychological factors in mathematics learning self-efficacy, anxiety, and interest serve as foundational enablers of both academic success and workforce readiness.

The researcher used semi-structured interviews to collect data from forty secondary school students in Navi Mumbai region: twenty from SSC school students and twenty from CBSE school students. Thematic analysis was conducted, and results showed that students' confidence in their ability to do well in mathematics was mainly influenced by past success; teachers' clarity of instruction; and teachers' encouragement. Students reported anxiety about mathematics, especially during exams, oral responses, and public performance. Their interest in mathematics varied based on teaching methods, classroom atmosphere, real-life relevance, and opportunities for active participation. Since psychological factors strongly influence engagement and achievement in mathematics, teachers should provide emotional and motivational support, build positive teacher-student relationships, use real-life examples, and adopt strategies to reduce mathematics anxiety.

Keywords: *National Education Policy (NEP) 2020, Mathematics Learning, Psychological Factors: Self-Efficacy, Mathematics Anxiety, Student Interest, Employment Skills, Thematic Analysis, Secondary School Students.*

- **Introduction:**

"Mathematics is everywhere around us - in the flowers we count, the cookies we share, and the games we play!" - *Shakuntala Devi.*

The statement highlights that mathematics is an integral part of everyday life, and recognizing this relevance is essential for fostering positive attitudes, confidence, and effective learning among students. Mathematics is commonly referred to as a logical reasoning-based discipline that requires a structure if a person is going to be successful. In addition to cognitive ability, however, a student's performance in mathematics is influenced by psychological determinants that affect his/her perception of the discipline as well as the

manner in which he/she engages with mathematics. A student's self-efficacy or belief that he/she can succeed in mathematics, has a significant impact on his/her ability to persist and expend effort to attempt higher levels of difficulty. Conversely, mathematics anxiety has a negative impact on concentration, working memory, and confidence. Interest in mathematics serves to influence a student's motivation to learn mathematics and continue with mathematics over a long period of time. Understanding the psychological factors that influence a student's performance in mathematics can significantly improve the learning outcomes of secondary school students. This study will present the results of interviews conducted with students to investigate their experience in the classroom with mathematics. This will provide a window into the student's thought processes about his/her experience of mathematics and give an insight to the psychological factors that affect the learning of mathematics.

- **Methodology:**

➢ **Research Design:**

A qualitative research design was adopted to understand students lived experiences related to mathematics learning. Semi-structured interviews allowed students to freely express their thoughts, emotions, and attitudes without restriction.

➢ **Participants:**

From the two school boards, SSC and CBSE, 40 students were sampled from grade 9 students.

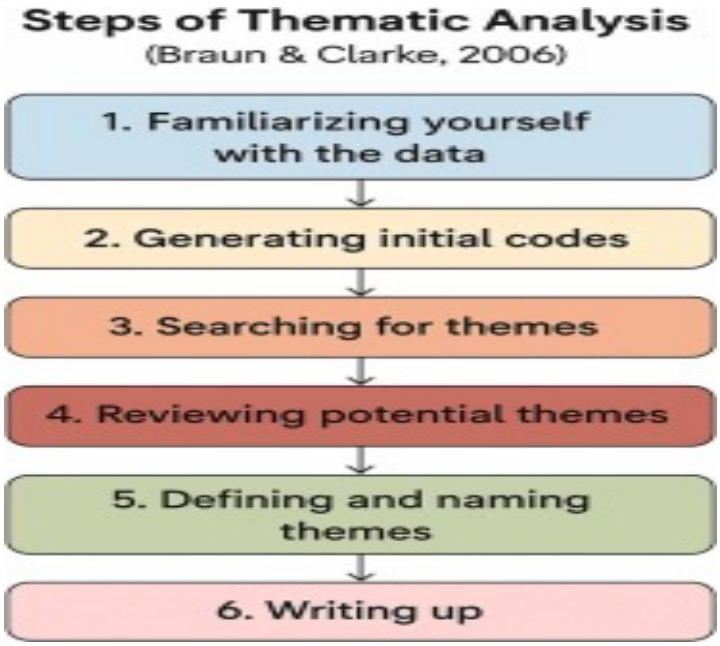
➢ **Tool for Data Collection:**

Three dimensions of psychology were used to develop a semi-structured interview guide for interviews with students about their attitudes and experiences towards math: self-efficacy, math anxiety, and interest level. Questions that might appear in the interview included:

1. What helps you believe that you can do well in mathematics?
2. How do you feel when you face a very difficult math problem?
3. Why do you think you can or cannot perform well in math tests?
4. When do you feel most confident while learning math?
5. What situations in math class make you feel stressed or nervous?
6. How does your body or mind react when you are anxious about math?
7. Why do you think math sometimes makes you feel worried or tense?
8. When do you feel the highest level of anxiety in relation to math?
9. What helps you calm down when you feel anxious about math?
10. What motivates you to try your best in mathematics?
11. Why do you feel excited or uninterested in learning math?
12. How does achieving good results in math affect your motivation?
13. When do you feel most interested in math lessons?

How the Data Were Collected and Analysed

All interviews were about 10 to 15 minutes long. Each student was promised confidentiality and encouraged to be truthful. Braun and Clarke's theme-based qualitative analysis (6 steps) was used to analyze the data collected from the interviews with the students.



- **Findings and Discussion:**

The thematic analysis generated four major themes that reflect the "Psychological Dimensions of Inclusive Mathematics Learning and Employability".

➢ **Theme 1: Self-Efficacy in Mathematics**

Students with higher confidence mentioned they were willing to try problems that were difficult and to keep going even after they made mistakes. Students felt confident mainly when lessons were clearly explained or when they had succeeded earlier, showing that their confidence depended on the situation.

One student shared, "If the teacher explains it slowly, I can solve everything, but when the steps are confusing, my confidence goes down." Another responded, "I feel confident in geometry and also get good marks, but algebra still scares me."

Students' self-efficacy in mathematics was shaped by clear instruction and guided practice, with repeated success strengthening confidence and repeated failure leading to self-doubt.

The findings align with Bandura's view that self-efficacy develops through positive experiences, encouragement, and emotional stability, leading capable students to be more engaged, resilient, and less avoidant in mathematics.

➢ **Theme 2: Mathematics Anxiety**

Interviews revealed that mathematics anxiety was a dominant theme, with students expressing nervousness, fear of failure, performance pressure, and emotional discomfort during mathematical tasks. The most common triggers that students discussed included:

- Working on problems at the board
- Surprise test

- Difficult subjects (algebra, word problems)
- Fear of making a mistake in the presence of peers

Some student's stated that "Even when I know the correct answer, as soon as the teacher calls on me to go to the board, my mind goes totally blank." One other student stated: "When I take a math test my hands are always shaking because of how tense I get." Students described the barriers that anxiety created as affecting memory, logical reasoning, and the clarity of thought. This emotional tension hindered students' ability to apply learned concepts, by reducing working-memory capacity, and without support to address anxiety, it may lead to long-term avoidance of mathematics.

➢ **Theme 3: Interest Level**

Students' interest in mathematics varied, with many expressing greater enjoyment when lessons were engaging and connected to real life, as reflected in statements such as "Math is fun when the teacher shows me a real-world example" and "I enjoy math more when we learn through games or hands-on activities, while abstract and fast-paced teaching was reported to reduce interest and just writing numbers is not much fun." In some cases, students were inspired to learn mathematics by using hands-on, visual representations of objects, or problem-solving tasks that illustrated how they would apply math in real world.

➢ **Theme 4: Influence of Teacher Behaviour and Classroom Environment**

The behaviours of teachers have a strong influence on the psychology of the students while studying mathematics. Supportive, patient and approachable teachers create an environment that promotes student confidence and helps minimise student anxiety. When asked how they would describe the feelings of support felt from their teacher, students stated that they felt comfortable asking questions when the teacher was supportive. One student said, "I feel free to solve mathematics and also clear my doubts from the teachers because my teacher never scolds when I make mistakes." Another student said, "I lose interest when the teacher is strict and I am scared." Students expressed how they valued the way their teacher(s) taught:

- Clear explanations
- Slow pacing when teaching difficult concepts
- Using examples related to the real world
- Friendly and supportive communication
- Providing encouragement and positive feedback

A supportive classroom reduced fear, increased motivation, and boosted students' confidence, with teacher behaviour influencing self-efficacy, anxiety, and interest.

- **Findings and Suggestions:**

NEP 2020's emphasis on foundational skills, numeracy, and analytical thinking is strengthened when mathematics education addresses psychological readiness.

➢ Emotional well-being and motivation are inseparable from cognitive learning in mathematics. Mathematics classrooms should be recognized as spaces for both intellectual and emotional development, aligning directly with NEP 2020's learner-centric philosophy, for that provide detailed, sequential instruction; invite student questions and acknowledge minor victories.

➢ The study identifies mathematics anxiety, particularly exam-related stress is a major barrier to learning.

To lower stress level, utilize relaxation techniques, administer practice tests, and utilize non-punitive teaching techniques in the classroom. Reducing exam anxiety helps students develop emotional regulation, resilience, and clarity of thinking. These skills essential for high-pressure workplace environments.

- Findings indicate that students' interest and confidence increase when mathematics is taught through real-life applications, hands-on activities, and meaningful contexts. Include examples of how content relates to real life; use hands-on instructional activities; and use interactive teaching methods. Competency-based mathematics education fosters analytical thinking, decision-making, and problem-solving skills - core employability competencies highlighted in NEP 2020.

- The findings confirm that teacher's behaviour is a critical moderating factor influencing self-efficacy, anxiety, and interest. Teachers support and communication should be consistent, free from biasness, positive, and patient which helps to reduce fear and build self-confidence among students. Supportive teacher - student interactions cultivate communication skills, confidence, and collaborative attitudes these will help to enhance workplace competencies.

- By examining both SSC and CBSE students, the study underscores the need for psychological inclusivity across educational systems. This aligns with NEP 2020's goal of reducing systemic disparities and ensuring quality education for all learners.

- The psychological factors examined in this study directly influence employability such as Self-efficacy, Low anxiety and Interest and motivation. Education should be imparted as preparation for employability, entrepreneurship, and lifelong learning.

- **Conclusion:**

This study confirms that psychological factors significantly influence secondary school students' mathematics learning, with self-efficacy shaping challenge-taking, anxiety hindering performance, and interest driving long-term engagement. Teacher behaviour emerged as the most influential factor, as supportive and student-centred practices enhance confidence, emotional safety, and motivation, making emotional and motivational support as vital as content instruction.

In alignment with NEP 2020, the findings emphasize that effective mathematics education must integrate psychological support, competency-based learning, and inclusive pedagogy. Addressing self-efficacy, anxiety, and interest contributes to equitable learning, sustained engagement in STEM, and improved employability in a dynamic workforce.

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