

The Myths of Mathematics That Never Fits To the Academics of Engineering Students

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Abstract

In this article, authors investigate the sources and factors contributing to mathematics fear among engineering students in private institute. The research, encompassing a cohort of 100 participants, delves into the examination of internal and external elements that contribute to mathematics anxiety. The findings reveal the manifested aspects of fear of mathematics issues the student aspects (traditional learning processes). The document challenges the tradition of imparting mathematics in isolation and highlights the importance of clearly communicating the relevance of mathematics in the field of engineering. The summary emphasizes the ongoing difficulty of demonstrating the practical utility of mathematics in engineering and calls for a thorough reassessment in both the conceptualization and implementation of introductory engineering education.

Keywords: Mathematics Myths, Engineering Education, Math Anxiety, Descriptive Quantitative Analysis, Engineering Student Perceptions.

INTRODUCTION:

This article delves into the pervasive myths surrounding mathematics and their impact on the academic experiences of engineering students. Mathematics, considered a fundamental component of engineering education, is often surrounded by misconceptions and unrealistic expectations. The study seeks to unravel these myths and explore their implications on the learning journey of engineering students in higher education. In the realm of engineering education, students frequently encounter challenges and anxieties related to mathematics, which may be exacerbated by widely held misconceptions. The myths under consideration range from the perception of mathematical prowess as an inherent trait to unrealistic expectations about the immediate applicability of mathematical concepts in engineering practice. As engineering students transition into better education standards, they often carry with them preconceived notions about mathematics that can shape their attitudes, motivations, and overall academic performance. These misconceptions may lead to fear or phobia, commonly referred to as arithmophobia or numerophobia, influencing how students engage with and perceive the role of mathematics in their academic journey. This study aims to uncover and analyse the prevalence of these myths among engineering students. The investigation will shed light on the specific challenges and anxieties students face concerning mathematics, providing valuable insights into the factors contributing to the persistence of these myths within the academic context. The gender dimension will also be explored to understand potential variations in the perception of these myths among male and female engineering students.

Ultimately, this research contributes to the broader discourse on mathematics education in engineering, aiming to debunk prevailing myths and pave the way for a more accurate understanding of the role of mathematics in the academic and professional lives of engineering students. This study focuses on unravelling the myths surrounding mathematics from the perspective of engineering students, examining how these myths shape their academic experiences. In the context of higher education, engineering students often grapple with the perceived challenges and expectations associated with mathematics, which can significantly impact their learning journey. The myths in question range from the belief that mathematical ability is an inherent trait to unrealistic expectations regarding the immediate relevance of mathematical concepts in engineering practice. As students transition into higher education, they bring with them preconceived notions about mathematics, influencing their attitudes, motivations, and academic performance. These misconceptions may give rise to fear or phobia, creating barriers to effective engagement with mathematical concepts. Utilizing a descriptive quantitative analysis, this study aims to explore the prevalence of these myths among engineering students and understand how these beliefs influence their perceptions and experiences with mathematics. The research will provide valuable insights into the specific challenges and anxieties students face, shedding light on the factors contributing to the persistence of these myths within the academic context. Additionally, the study will examine potential variations in the perception of these myths based on gender, offering a nuanced understanding of how different groups of students navigate these challenges. By delving into the student perspective, this research contributes to a more comprehensive understanding of the dynamics between engineering education and mathematics, ultimately aiming to dispel prevailing myths and foster a more accurate perception of the role of mathematics in the academic and professional lives of engineering students.

Perceptions and Fear of Mathematics

Students commonly experience a fear of mathematics, primarily attributed to a perceived lack of interest in the subject. This apprehension may stem from challenges in engaging with mathematical concepts and finding them less appealing. However, the reality of students fearing mathematics implies a potential discrepancy between this perception and the actual experiences and difficulties they encounter in their mathematical studies. The field of mathematics often poses challenges for numerous students. Many individuals grapple with mathematical anxiety, characterized by a sense of tension, apprehension, or fear that hampers their performance in mathematical tasks. This phenomenon is frequently taken into account when investigating challenges faced by students in mathematics. Math anxiety can induce discomfort and is likely responsible for generating a negative attitude and aversion towards all activities related to mathematics. Students with high levels of math-related anxiety may steer clear of situations that require them to engage in mathematical tasks, leading to a reduced level of competence, limited exposure, and diminished practice in mathematics. Consequently, this leaves students more apprehensive and ill-equipped in their mathematical preparedness to succeed. In conclusion, math anxiety is a real phenomenon that can affect students' math performance and attitudes towards math. However, there are ways to overcome math anxiety, such as practicing math regularly, seeking help from teachers or tutors, and reframing negative thoughts about math.

Exploring Perceptions and Struggles

In the realm of B.Tech education, a notable challenge emerges from the perception of mathematics as an essential prerequisite for engineering. This perception, while inherent to the field, often contributes to

heightened levels of math anxiety among students. The belief that proficiency in mathematics is a fundamental requirement can create undue stress, fostering an environment where the fear of falling short in mathematical abilities becomes pronounced. This added pressure, in turn, may adversely impact students' confidence and overall performance in their academic journey. Concurrently, when delving into the specific struggles faced by students, a recurring theme surfaces—the formidable hurdle of advanced math courses. The primary factor underlying this challenge is a pervasive lack of foundational knowledge. Students often find themselves grappling with advanced mathematical concepts due to gaps in their understanding of the fundamentals. Addressing these challenges requires a holistic approach, encompassing both the perception of mathematics as a prerequisite and the need for bolstering foundational knowledge to navigate the complexities of advanced math courses effectively. The fear of mathematics is often heightened among engineering students, given the integral role mathematics plays in their coursework. The perception of mathematics as inherently challenging can be intensified, as engineering students often encounter complex mathematical theories and applications. The fear of failure becomes particularly poignant, as mathematical precision is crucial in engineering projects and designs. The pressure to perform well academically and meet rigorous standards adds to the anxiety, potentially leading to feelings of inadequacy or imposter syndrome. Several factors contribute to the struggles engineering students face with mathematics. The demanding nature of engineering programs, the fast-paced learning environment, and the expectation of high levels of precision create a challenging atmosphere. Teaching methods that do not align with diverse learning styles can exacerbate the difficulties, making it essential to explore more effective and engaging instructional approaches. To address these challenges, support systems, including tutoring services, collaborative study groups, and mentorship programs, can be instrumental in helping engineering students navigate their mathematical fears. Promoting a growth mindset and emphasizing the practical applications of mathematics in engineering can also contribute to a more positive perception of the subject, empowering students to overcome their fears and succeed in their academic endeavors.

Mathematics and Its Impact Engineering Students

The role of mathematics in education extends far beyond the classroom, significantly influencing the future trajectories of students. Mathematics serves as a cornerstone for enhanced career prospects, offering graduates a solid foundation to excel in various engineering disciplines. The proficiency in mathematical concepts acquired during their academic journey is a valuable asset, opening doors to diverse and challenging opportunities in the professional realm. Moreover, the impact of technology, specifically calculators and software, on students' math anxiety is noteworthy. Rather than exacerbating apprehensions, technology is a facilitator in the learning process. Calculators and software tools not only streamline complex calculations but also contribute to reducing anxiety by providing practical aids that enhance comprehension. As B.Tech students navigate the intersection of mathematics and technology, they are better equipped not only for academic success but also for a promising and less stressful journey toward fulfilling career prospects in the engineering domain.

Mathematics serves as the cornerstone of B.Tech education, playing a pivotal role in shaping the knowledge and skills of engineering students. It provides the essential language for understanding and expressing the principles that underlie various engineering disciplines. Concepts like calculus, linear algebra, and differential equations not only form the bedrock of theoretical understanding but also empower students with the tools necessary for problem-solving and critical analysis. Over the academics,

mathematics goes beyond being a subject—it becomes a fundamental approach to thinking and reasoning, fostering a systematic and logical mindset crucial for engineering practice. The integration of mathematical modeling, simulation, and computational methods equips students with the ability to apply theoretical knowledge to real-world scenarios, enabling them to design, analyze, and optimize engineering systems. Furthermore, the interdisciplinary nature of mathematical principles facilitates collaboration between different engineering domains, fostering innovation and pushing the boundaries of technological advancement. While mathematics is undeniably challenging, its mastery is essential for the holistic development of engineering students and their ability to contribute meaningfully to the ever-evolving field of technology.

Navigating Math Anxiety Students

In the dynamic realm of engineering education, the fear of mathematics exams stands as a palpable challenge, casting a shadow on the academic journey of many students. The root cause often lies in the profound anxiety surrounding the possibility of failure, intensifying the pressure to excel in exams. This anxiety, if left unaddressed, can permeate the entire academic experience, adversely affecting performance and overall well-being. However, amidst these academic challenges, a beacon of relief emerges through the integration of real-world applications. This seeks to delve into the intricacies of math anxiety and unveil the transformative power of practical applications as a strategic approach. Real-world applications act as a potent antidote, demonstrating the tangible and practical utility of mathematical concepts.

By immersing students in real-life contexts where mathematical principles find direct application. This connection to real-world scenarios not only fosters a deeper understanding but also serves as a remedy for anxiety, transforming the learning experience into a more engaging and meaningful journey for engineering students.

In the landscape of engineering education, the intersection of practical applications and mathematical concepts becomes a crucial strategy for navigating and mitigating the pervasive fear of math exams. This connection to real-world scenarios not only fosters a deeper understanding but also alleviates anxiety, transforming the learning experience into a more engaging and meaningful journey for engineering students. In this way, the intersection of practical applications and mathematical concepts becomes a crucial strategy in navigating and mitigating the pervasive fear of math exams within the engineering academic landscape.

Bridging the Gap Between Theory and Practical Relevance

In the realm of engineering education, the imperative to address challenges in mathematics instruction takes center stage. One pivotal aspect is the integration of real-world context, a transformative approach aimed at shaping engagement and alleviating the pervasive fear associated with mathematics among B.Tech students. A notable challenge arises from the often abstract nature of mathematical problems that lack tangible connections to real-world applications. This abstraction renders the subject seemingly irrelevant to students, hindering their ability to perceive the practical implications of theoretical principles. The absence of practical connections diminishes enthusiasm and creates a barrier to understanding the relevance of mathematical concepts. To effectively counteract the widespread fear of mathematics engineering students are encouraged to proactively seek assistance and make use of available resources. Seeking help not only provides the necessary support to navigate challenging concepts but also contributes to the cultivation of a collaborative learning environment. This collaborative approach, coupled with a

deliberate effort to bridge the gap between abstract theories and real-world applications, empowers students to transform their mathematical learning experience. By incorporating practical relevance into the curriculum and actively seeking additional support, engineering students can bridge the divide between theoretical concepts and their real-world significance. This dual strategy proves instrumental in enhancing the overall mathematical journey for B.Tech students, fostering engagement and dispelling the fear traditionally associated with the subject. Join us in exploring this concerted effort to create a more meaningful and relevant mathematics education for B.Tech students.

Conclusions:

The paper contends that integrating mathematics with engineering principles is crucial, as the current separation poses challenges in transferring mathematical concepts to the engineering context. The risk of losing the perception of the broader utility of mathematics in engineering arises when it becomes isolated from practical applications. The study highlights implications for pedagogic practices in engineering courses and suggests that incorporating discipline-specific engineering examples into mathematics instruction, at the very least, would significantly enhance students' perceptions.

The theoretical framework emphasizes the need to consider values associated with the 'use' and 'exchange' of mathematics in engineering. To improve the engagement of students aspiring to become engineers with mathematics, it is argued that they must perceive the practical application of mathematics to their field continuously. The paper suggests that achieving this requires engineers themselves to design the entire curriculum and its progression appropriately. While there is evidence that mathematics teachers with expertise in students' difficulties at various levels can contribute, the primary responsibility lies with engineers in shaping the curriculum for effective integration.

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