Mathematical problem-solving has traditionally been viewed through the lens of logical and analytical thinking, emphasizing structured cognitive processes. However, Aldous’s findings suggest that this approach might be limited, particularly when students face novel and complex problems. Embracing a more holistic problem-solving style that includes intuitive and emotional thinking can lead to more innovative and effective solutions.

INTERNATIONAL

According to Dr. Carol Aldous (2020) from Flinders University argues that intuitive and emotional thinking is essential for solving mathematical problems. In this study that involves 405 students, found that while cognitive processes are important, they are insufficient alone for tackling novel problems. Aldous suggests that embracing creativity and emotion in math education could transform how students learn and solve problems, challenging the traditional view that feelings slow down analytical thinking.

Mathematical problem-solving has traditionally been viewed through the lens of logical and analytical thinking, emphasizing structured cognitive processes. However, Aldous’s findings suggest that this approach might be limited, particularly when students face novel and complex problems. Encouraging students to use a more easy problem-solving style that includes intuitive and emotional thinking can lead to more innovative and effective solutions.

In addition, according to Hanula (2015) emotions are important part of non-routine problem solving. A positive disposition to mathematics has a reciprocal relationship with achievement, both enhancing the other overtime. In the process of solitary problem solving, emotions have a significant role in self-regulation, focusing attention and biasing cognitive processes.

---We see that individuals who approach problems with a positive disposition are more likely to engage deeply and persistently with challenging tasks. Their emotional regulation helps maintain focus and manage frustration, leading to more effective problem-solving strategies and higher achievement. Emotions act as encouragement and a support system in the cognitive processes required for successful mathematical problem solving.

Hannula, M.S. (2015). ***Emotions in Problem Solving***. In: Cho, S. (eds) Selected Regular Lectures from the 12th International Congress on Mathematical Education. Springer, Cham. https://doi.org/10.1007/978-3-319-17187-6\_16

Moreover, based on the study of Wahyuni et al., (2024) revealed that math anxiety and self-confidence significantly impact junior high school students’ geometry problem-solving, accounting for 22.6% of performance variance. Emotions, particularly math anxiety and self-confidence, influence math learning outcomes, consistent with previous research. Math anxiety hinders geometry problem-solving, while self-confidence enhances it. Students with low anxiety and high self-confidence excel in problem-solving. Mathematical self-confidence and anxiety affect overall math performance. High math confidence fosters positive attitudes, resilience, and enjoyment of math. Unfortunately, math anxiety prevails across education levels, causing student distress. The previous studies of this research study that will support the study of Wahyuni et al., (2024) also highlights that there’s a significant relationship between emotional intelligence and problem-solving abilities (Pekrun et al., 2017). Emotions significantly impact mathematics learning performance. Studies show positive emotions, such as self-confidence, strongly correlate with mathematics achievement (Ciftci & Yildiz, 2019; Miscevic-Kadijevic, 2015).

--Math anxiety and self-confidence significantly influence high school students’ ability to solve geometry problems. Math anxiety hinders problem-solving, while self-confidence enhances it. Students with low anxiety and high self-confidence perform better in math. High self-confidence fosters positive attitudes and resilience, whereas math anxiety remains widespread and distressing. Positive emotions like self-confidence are strongly linked to better math performance. Emotions are crucial in math learning, with self-confidence boosting and hindering performance.

Furthermore, according to Suparman (2021) Achievement emotions, such as anxiety, frustration, and hope, are always involved in student learning activities because they are biological and psychological conditions associated with learning activities like problem-solving and examinations. The interaction between students, Mathematics teachers, and Mathematics learning created activities during Mathematics learning process. One of Mathematics learning process forms is Mathematics evaluation. Thus, Mathematics ability test, such as mathematical problem-solving ability, must involve achievement emotions

---In mathematical problem-solving styles many students may experience varying levels of these emotions based on their approach to problem-solving. In this study, a student who apply a systematic and confident problem-solving style might experience more hope and less anxiety, whereas a student who struggles with mathematical concepts may feel more frustration and anxiety.

Recognizing and addressing these emotions can help teachers tailor their instructional methods and support to improve students’ problem-solving abilities and overall learning experiences.

Suparman, S. et al (2021). ***Achievement emotions of female students in mathematical problem-solving situations.***  J. Phys.: Conf. Ser. 1806 012106 DOI 10.1088/1742-6596/1806/1/012106

[Achievement emotions of female students in mathematical problem-solvings situations](https://iopscience.iop.org/article/10.1088/1742-6596/1806/1/012106/meta)

NATIONAL

In the Philippines, according to Legarde (2022) many learners experience different academic emotions and feelings in the schools today. Empirical evidence reveals that emotions and feelings, in addition to cognitive and motivational components, play an essential influence in students’ mathematical academic engagement and accomplishment. It begins with the processing of information at the conscious and unconscious levels of an individual when dealing with a mathematical problem.

--- Emotion and feelings are likely involved in doing mathematical problem-solving. This study shows that emotions and feelings can serve as a cognitive and motivational components for the students to be engaged in their mathematical performance. This style in mathematical problem-solving depends of how the students deal to mathematical problem.

In addition, Emotions plays a significant role in mathematical problem-solving styles, influencing students’ performance and engagement. Emotions such as curiosity, frustration, and satisfaction impact how students approach problems and persist through challenges. Positive emotions can enhance motivation and achievement, while negative emotions like anxiety can hinder performance. Research indicates that different emotional responses are tied to feedback during problem-solving, affecting accuracy and persistence. Overall, understanding the interplay between feelings and problem-solving strategies is crucial for fostering effective learning environments in mathematics (Gahi et al., 2023).

---In solving mathematical problems the students consider their emotions. In dealing with a mathematical problem the curiosity of the students works, the students can also feel frustration in different ways. The impact of having a positive emotions in solving mathematical problems can motivate the students on completing it.

Furthermore, according to that study of Layco (2020) there are many students’ feelings to be considered in the classroom aside from anxiety. Feelings such as anger, boredom, enjoyment, hopelessness, shame, and pride can influence students’ learning in different ways. Moreover, these can be affected by learning environment factors, students’ individual differences, and external factors. Variety of emotions and their causes, teachers should have a knowledge on how to moderate the academic emotions of students, especially their negative feelings such as anger, anxiety, boredom, hopelessness, and shame since studies showed that these were negatively correlated to their mathematics performance.

---Many students’ emotions beyond anxiety, such as anger, boredom, enjoyment, hopelessness, shame, and pride, significantly impact learning. These emotions are influenced by the learning environment, individual differences, and external factors. Teachers need to understand how to manage students’ academic emotions, especially negative ones. In this study, through emotional regulation can enhance students’ accuracy and persistence in solving mathematical problems.

like anger, anxiety, boredom, hopelessness, and shame, which are negatively correlated with mathematics performance. Addressing these emotions is crucial for developing effective problem-solving styles in mathematics, as emotional regulation can enhance students’ persistence and accuracy in solving mathematical problems.

Therefore, emotional factors, particularly math anxiety and self-confidence, significantly influence students’ mathematical problem-solving performance and strategies.

The research indicates that emotions play a crucial role in mathematics learning. Positive emotions like self-confidence enhance performance, while negative emotions such as math anxiety hinder it. Emotion-focused coping strategies can help students manage these feelings. Understanding this interplay is essential for developing effective educational approaches that foster resilience and achievement in mathematics, ultimately addressing the challenges faced by students in this subject area