

Assessing the relationship between the emotional states of individuals and their effect on mental performance while dealing with activities demanding intellectual effort

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Research questions

This research aims to understand how student's emotional states impact their engagement with academic materials. It specifically examines how emotions in learning such as boredom, frustration, and engagement influence student's cognitive processes and overall academic involvement. By investigating these factors, the study seeks to find ways to harness these emotions to maximize student's academic performance.

Background

Recent advancements in educational psychology and cognitive science underscore the significant role of emotions in shaping student's engagement, motivation, and cognitive processes during learning (Tyng et al., 2017). Previous studies have categorized these emotions as positive (linked to flexible learning strategies and intrinsic motivation) and negative (linked to rigid learning strategies and extrinsic motivation) (Pekrun, Elliot, & Maier, 2009).

Aim

This research aims to identify emotions associated with different learning strategies and motivational factors by analyzing students' responses to the PANAS and AEQ questionnaires. Using self-reports and critical thinking exercises, the study examines how emotional states affect productivity and engagement in academic tasks. By identifying these emotions, we seek insights into cognitive states that can inform strategies to enhance overall productivity.

Procedure

The study involved 25 participants, the mean age of participants was 20.5 years (SD = 1.8), enrolled in university education across various majors and backgrounds. The participants are bilingual and representing a diverse range of cultural and educational perspectives. The sample included individuals of both genders.

Procedure

The data was collected using the AEQ and PANAS questionnaires, followed by a critical thinking question, in the sequence shown in Fig 1.

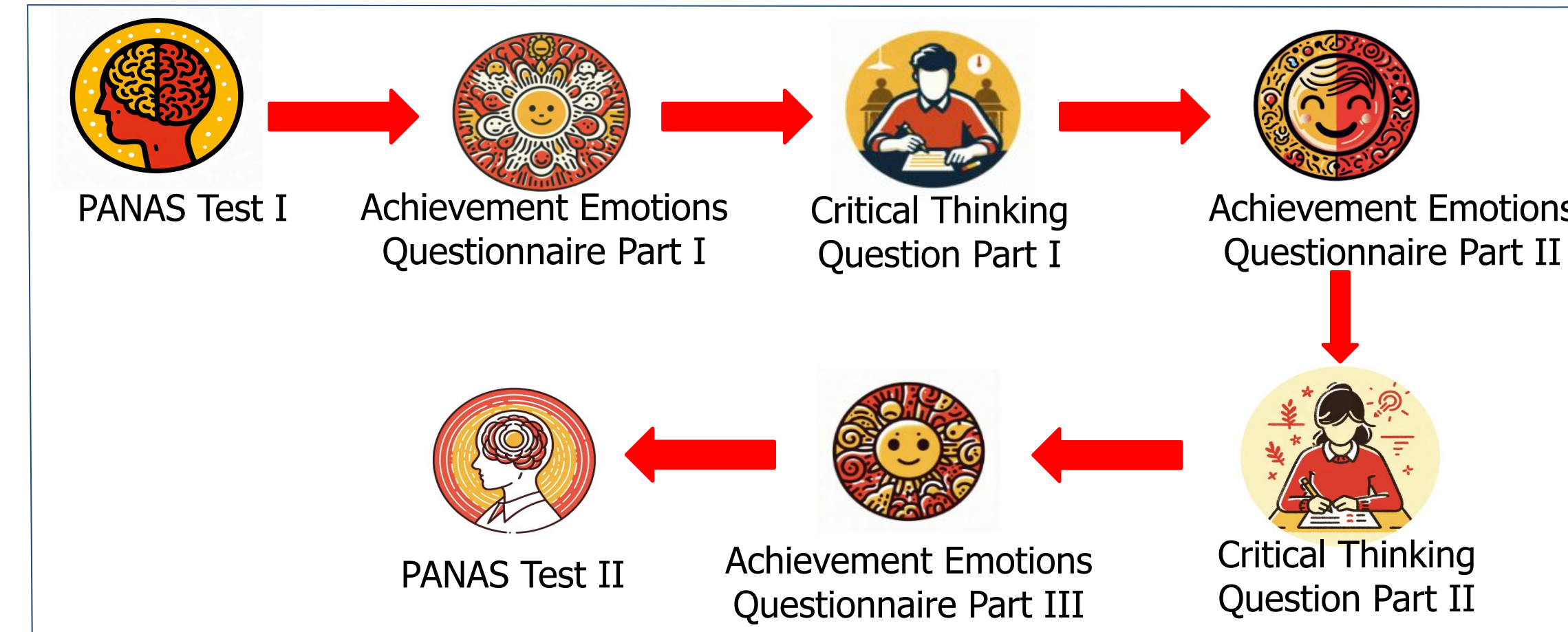


Figure 1: Sequence of PANAS tests, Achievement Emotions Questionnaires, and Critical Thinking assessment

Results

- The PANAS test measured participants' positive and negative emotions. As shown in Fig 2, positive affect increased and negative affect decreased after completing the critical thinking question, indicating improved emotional stability. T-tests revealed significant changes in positive ($t(24) = -1.75, p = 0.0458$), while negative affect were not significant ($t(24) = -1.50, p = 0.0731$).
- The AEQ assessed (Fig 3 and Fig 4) academic emotions, revealing significant changes before, during, and after completing the critical analysis question. Before and after the task, hope ($t(24) = -1.74, p = 0.0474$) and relief ($t(24) = -1.95, p = 0.0312$) fig 3 showed significant changes, while pride and enjoyment did not demonstrate significant shifts. During the task, emotions like anger ($t(24) = -1.97, p = 0.0300$) and boredom ($t(24) = -1.90, p = 0.0347$) significantly decreased. Additionally, shame ($t(24) = -1.94, p = 0.0319$) significantly decreased before and after the task, indicating a reduction in negative emotional states.
- Correlation analysis shows that as participants completed all the activities, positive emotional changes increased. The PANAS and AEQ results suggest that critical thinking tasks led to improved emotional stability, with significant increases in positive affect (hope and relief) and reductions in negative emotions (shame, anger, and boredom). These findings indicate enhanced motivation, focus, and engagement, highlighting the positive emotional impact of engaging with the tasks.

References

- Pekrun, R., Elliot, A. J., & Maier, M. A. (2009). Achievement goals and achievement emotions: Testing a model of their joint relations with academic performance. *Journal of Educational Psychology, 101*(1), 115–135. <https://doi.org/10.1037/a0013156>
- Tyng, C. M., Amin, H. U., Saad, M. N. M., & Malik, A. S. (2017). The influences of emotion on learning and memory. *Frontiers in Psychology, 8*, 1454. <https://doi.org/10.3389/fpsyg.2017.01454>

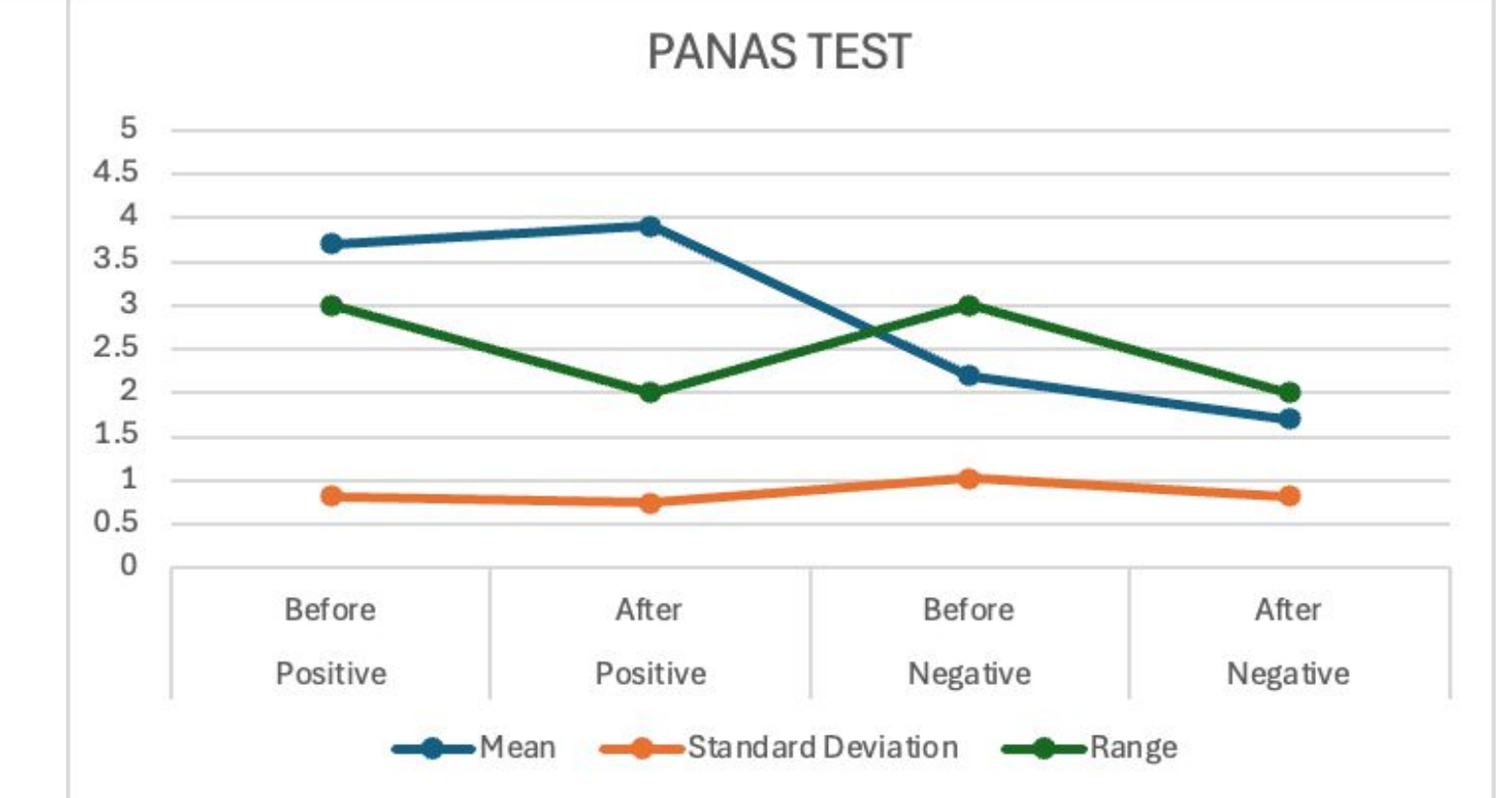


Figure 2 show that participant's emotional state remained positive before and after the event, with higher mean values for positive emotions, especially post-event. The lower standard deviation and range indicate more consistent responses. Negative emotions were low overall, with a slight increase post-event, but positive emotions remained dominant.

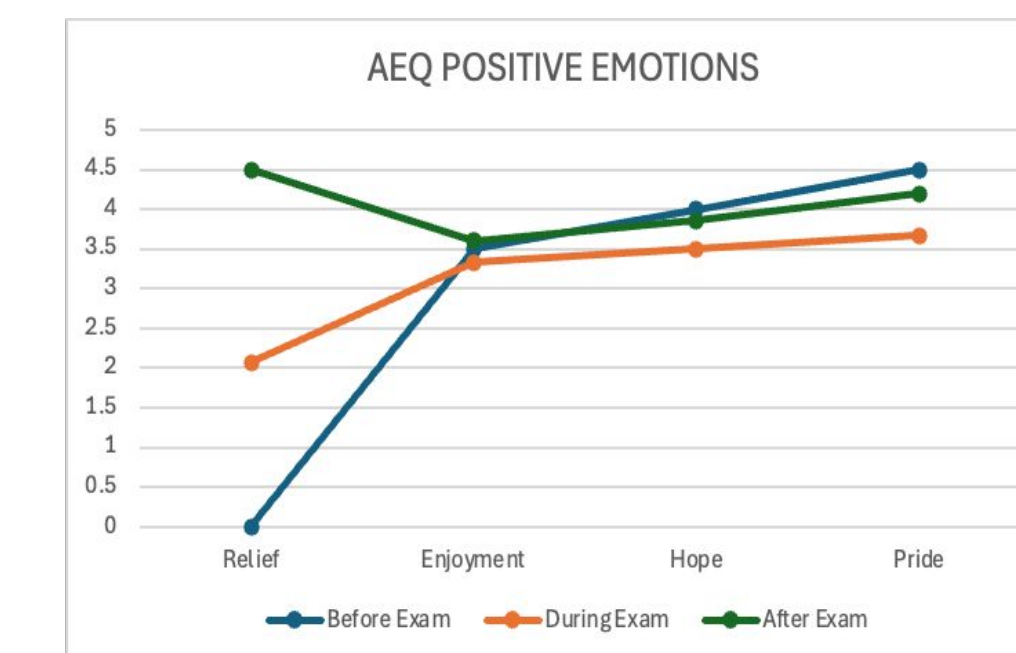


Figure 3 shows positive emotions slightly decrease during the exam but rise afterward, while relief steadily increases throughout and post-exam.

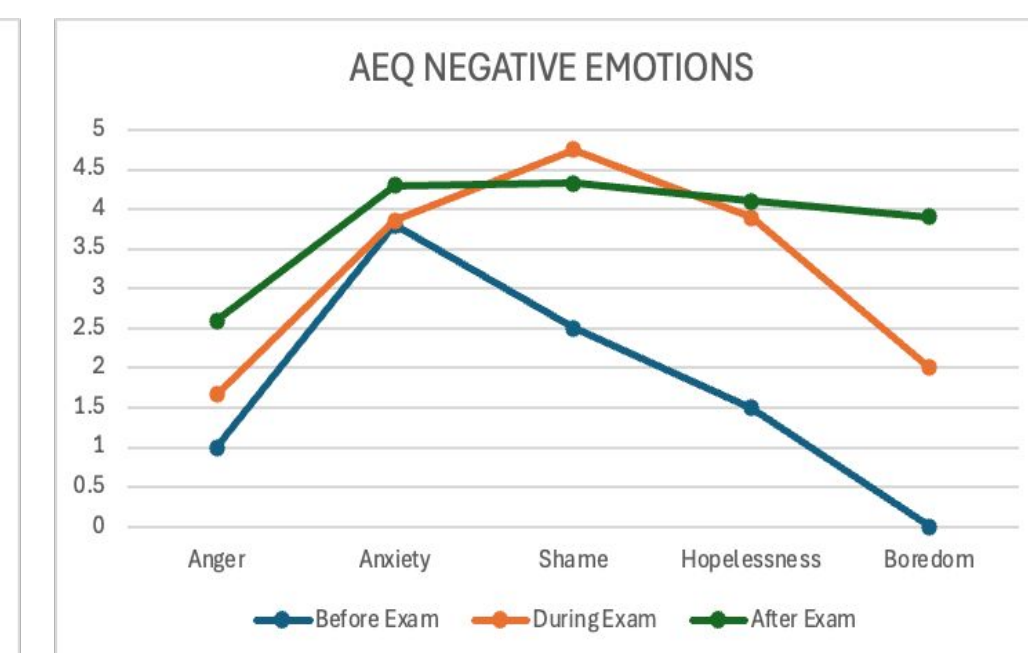


Figure 4 shows negative emotions rising during the exam and decreasing afterward, reflecting temporary stress and emotional relief post-exam.

Conclusion

PANAS and AEQ results indicate that students' emotional states fluctuate throughout cognitive tasks. Positive emotions like enjoyment and pride are linked to intrinsic motivation and persistence, while negative emotions like anxiety and shame are associated with extrinsic motivation and disengagement. This study confirmed that emotional states play a crucial role in shaping students' focus, task engagement, and productivity. Positive emotional shifts were found to enhance focus and engagement, while declines in negative emotions supported better productivity and task completion. Overall, emotions reflect our social nature and significantly influence our actions, task approaches, and behavior throughout the day.