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# WHAT DOES EMOTIONAL ENGAGEMENT OF UNDERGRADUATE STUDENTS WITH EXPERIMENTS DEPEND ON?

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## Introduction

Students' emotional engagement is one of the important factors to be considered in Physics Education Research. Our study aims to investigate the role of colour, and the inclusion of a history of science context in generating students' emotional engagement (Stinner, 1993). We have tried to engage students emotionally with thermal physics through an experiment.

## Research question

Do students emotionally engage in the experiment if colours and a history of science context are included in the experiment notes?

## Methodology

We constructed an 'intervention' experiment on thermal physics. This was a guided inquiry experiment with clear instructions. Students were explicitly asked to discuss, analyze and interpret. We included a colourful story on the 'History of Heat' in the introduction of the experiment. The 'control' experiment on 'ultrasound waves' was written in a standard manner and was not modified. We designed a survey of 19 items based on Peixoto et al. (2015) and four open-ended questions. The surveys were given to the students of both the 'intervention' and 'control' groups.

## Data Collection

This study was done over three weeks of laboratories for 1st year 1st semester regular undergraduate students at the University of Sydney. The data collected were 1) observational field notes 2) surveys 3) logbooks. Surveys were collected from 339 students, 190 for the 'intervention' and 149 for the 'control'.

## Results

Our preliminary results indicate that students were more emotionally engaged in the 'intervention' compared to the 'control'. Some quotes were:

"fantastic! It affected me in a very positive way, enlightening not only me but my fellow peers in the field of thermal physics"

"excellent with description and picture"

"very easy to follow, fun and much clearer instruction"

Comprehensive data analysis will be presented at the conference.

## Conclusion

Our study shows that a simple change in the way experiments are presented to the students results in improved emotional engagement; students reported that the experiment was easier to understand and more enjoyable.

## References

- Stinner, A. (1993) Conceptual change, history, and science stories, *Interchange*, 24 (1/2), 87-103.
- Peixoto, F., Mata, L., Monteiro, V., Sanches, C. & Pekrun, R. (2015) The Achievement Emotions Questionnaire: Validation for Pre- Adolescent Students, *European Journal of Developmental Psychology*, 12(4), 472-481.

**Apply to be<br> considered for a student <br> &nbsp; award (Yes / No)?**

no

**Level for award<br>&nbsp;(Hons, MSc, <br> &nbsp; PhD, N/A)?**

n/a

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