

# Confronting Science Anxiety through In Dialogue with Nature

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## 1. Project Objective

1. To identify the possible factors contributing to the change in students' science anxiety after taking 'In Dialogue with Nature', a general education foundation course.
2. To reduce students' science anxiety and increase their efficiency in learning.

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Fig.2 - Percentage of SA students by Faculty

## 2. Methods

### Science Anxiety Questionnaire



1. 22 pairs of science & non-science analogous situations.
2. Students rate their level of anxiety on a 5-degree scale: "not at all", "a little", "a fair amount", "much", or "very much".

### Science Question

Q30. Precisely inflating a balloon to be used as apparatus in a Physics experiment.

### Non-science Question

Q21. Filling your bicycle tires with the right amount of air.

Students were asked to fill in the SAQ before and after taking "In Dialogue with Nature"

## 3. Analysis

### Terminology

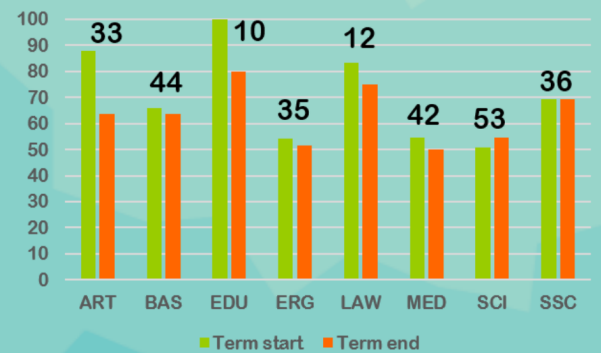
$$N = GA + NGA$$

SA NSA

N = Total sample  
GA = generally anxious  
NGA = not generally anxious  
SA = science anxious  
NSA = non-science anxious

$\%SA = SA/N \times 100\%$   
Average SA = Average no. of SA questions being answered 'much' or 'very much' among all students

2014-15, Term 2  
& 2015-16 Term 1



2015-16 Term 2  
& 2016-17 Term 1

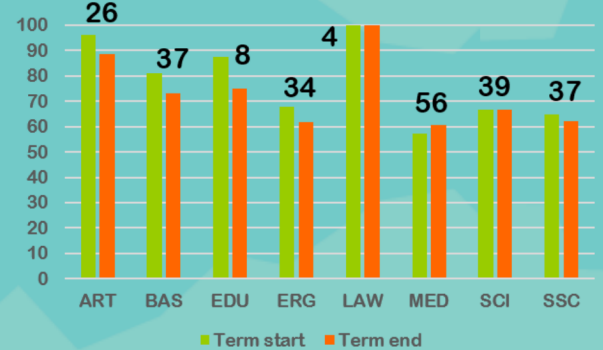
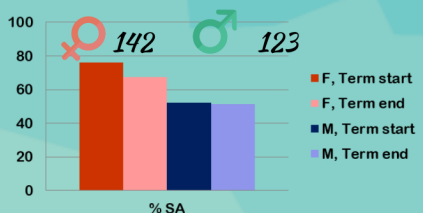
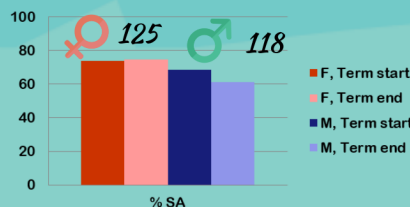


Fig.1 - Percentage of SA students & Average no. of SA questions being answered 'much' or 'very much' frightened by gender

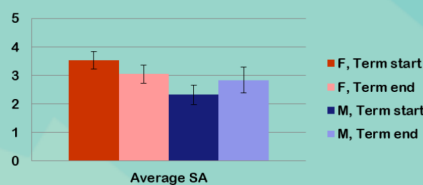
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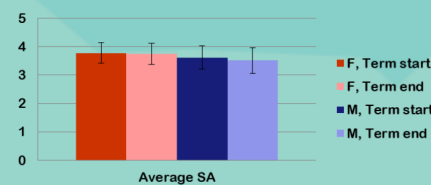
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2

Is there any change in the way you feel about science after taking the course?

The course has given me a positive feeling about science. I used to think that science is 'professional' stuff. I just memorize the equations and stuff facts into my head. way...we were exposed to different scientific issues. It allowed us to develop our interests and not to feel anxious.

Some authors from the texts have spent their whole lives in research, published papers until the day they died. I studied science in high school, but I don't think I have such patience and perseverance. .... I really admire this spirit and it is remarkable as a human being.

Which component of learning (or assessment) generates the greatest anxiety?

Source of Science Anxiety  
= Fear for getting it wrong!  
● Affecting the GPA  
● Losing face in group discussion

I'm afraid of misinterpreting the ideas of the texts and making mistakes in writing papers and doing quizzes.

## Focus Group Interviews

7 students from 5 faculties & taught by 3 UGFN teachers were interviewed

A text was about whether we could use science to prove the existence of free will... It makes me think of these questions: 'Can science explain everything? Or does it create more questions?'

- Feeling positive & less anxious towards science
- Recognizing the nature & limitation of science
- Appreciating scientific spirit

Correlation of scientific knowledge to daily life

Flinging away the cockroach on your arm - Newton's laws

Teacher's guidance on how to write a term paper

Mobile App 'DiaNable'

Teachers being smiley and encouraging when students answer questions in front of class.