Cognitive and Affective Influences on Science Anxiety in a Science Core-text General Education Course in Hong Kong

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General Education Foundation Programme - "In Dialogue with Nature (UGFN 1000)"

- Direct dialogues with classics
- Student-oriented teaching in small classes
- Assisted with lectures
- Discuss core questions relevant to contemporary context brought up by the classics

After taking UGFN, they:
~ feel positive and are less anxious towards science
~ recognize the nature and limitation of science
~ appreciate scientific spirit.

Source of science anxiety- Fear for getting it wrong!

Project Objective

- To investigate if a relationship among students' science anxiety, their understanding of NOS (cognitive) and their self-efficacy (affective) towards UGFN1000 exists;
- To evaluate how students' science anxiety, their understanding of NOS, and their self-efficacy towards UGFN1000 change after they have finished the course

Science Anxiety

Science Anxiety Questionnaire (SAQ) (Alvaro et al.,1978)

7 science & 7 non-science scenarios, with emphasis on analogous situations

14 Questions

Sample questions

順序牢記三十位近代中國帝王的名字。
Memorizing the names of thirty recent Chinese emperors in chronological order.
順序牢記化學元素周期表上首三十種元素的名稱。
Memorizing the names of the first thirty elements in the periodic table in order.

Science Anxiety, Nature of Science & Course Self-efficacy Questionnaire' (SANCE)

Nature of Science

1. Scientific knowledge - 5 Qs
2. Scientific method - 3 Qs
3. Scientists' work - 2 Qs
4. Scientific enterprise - 4 Qs

Myths of Science Questionnaire (MOSQ) (Buaraphan et al., 2009)

Sample questions

科學家都不帶任何偏見。
Scientists are without any biases.
不同文化都會孕育出相同的方法去探索大自然。
Different cultures nurture the same ways to gain scientific knowledge.

Self-efficacy towards UGFN1000

8 questions related to UGFN and the four aspects were designed.

Sample questions

有些我認識的同儕能讀好「與自然對話」，所以相信我也可以的。
Some peers that I know could study 'In Dialogue with Nature' well, so I believe I can make it too.
每次與朋友提到「與自然對話」，我都有吐苦水的感覺。Whenever I mention 'In Dialogue with Nature' with my friends, I feel like pouring out my woes.

Sources of self-efficacy related to science (Britner 2006)

1. Mastery experiences
2. Vicarious experiences
3. Social persuasions
4. Physiological arousal

Results of Multiple Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.550[a]	.303	.287	.63936

a. Predictors: (Constant), Q2, Year, Faculty, Gender, Q1, Course efficacy

ANOVA[a]

Model		Sum of Squares	df	Mean Squares	F	Sig.
1	Regression	48.612	6	8.102	19.820	.000[b]
	Residue	112.006	274	.409		
	Total	160.618	280			

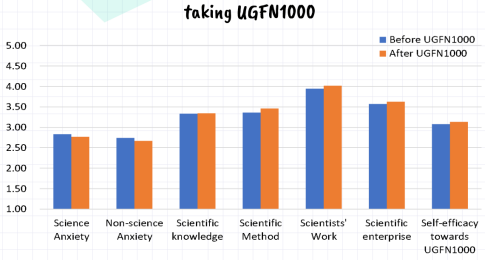
a. Dependent Variable: Science Anxiety
b. Predictors: (Constant), Q2, Year, Faculty, Gender, Q1, Course efficacy

Coefficients[a]

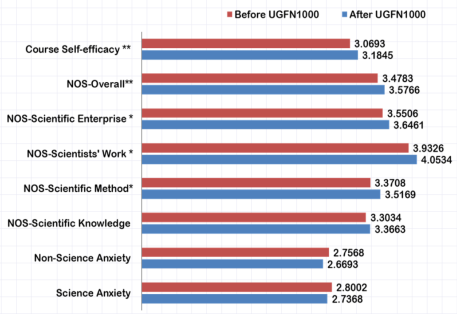
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.289	.231		1.251	.212
Course self-efficacy	-.536	.091	-.357	-5.923	.000***
Faculty	.016	.015	.055	1.055	.292
Year	.069	.070	.051	.984	.326
Gender	-.141	.081	-.092	-1.738	.083
Number of Science subjects taken in high school	-.198	.038	-.291	-5.206	.000***
Eagerness to study UGFN1000	-.001	.056	-.001	-.014	.989

a. Dependent Variable: Science Anxiety

Mean Scores in SANCE before and after students taking UGFN1000



Graphical presentation of Paired Samples Tests



After taking UGFN1000, students have significantly greater understanding of NOS (Cognitive) & self-efficacy towards the course(affective) .

Cognitive understanding of NOS has NO ROLE in students' level of Science Anxiety (affective).

Course self-efficacy (affective) & number of science courses taken in high school are negatively related to level of Science Anxiety (affective).

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