

# ASSESSING THE RELATIONSHIP BETWEEN ATTITUDES TOWARD CHEMISTRY, CHEMISTRY SELF-EFFICACY BELIEFS, AND CAREER ASPIRATIONS OF UNDERGRADUATE CHEMISTRY STUDENTS

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## Background

Science education is of profound importance in the society today, hence a great deal of effort is being put on research in order to provide interventions aimed at enhancing the quality of teaching and learning of science courses in both basic and higher institutions of learning. Most of the research activities have tried to establish connection between various variables such as learners' attitudes toward science subjects, self-efficacy beliefs and career aspirations, deemed to affect the quality of science education. Most of these research has focused on science education in secondary school thereby presenting an opportunity for more of such studies focused on tertiary learning institutions.

## Aims

This study therefore seeks to investigate potential associations between undergraduate students' attitudes toward chemistry, their self-efficacy beliefs, career aspirations and learning outcomes in three countries. The study also aims at developing various interventions that will be informed by the findings of the questionnaire surveys and interviews.

## Design and methods

The study is to take the form of a mixed method cross-sectional study. Data is to be collected from target participants who undergraduate chemistry students what at various year levels of study. Both questionnaire survey and interviews will be used in data collection from three tertiary institutions in the three countries. A questionnaire survey targeting fresh undergraduate chemistry students has been conducted in weeks 5 and 6 of semester one in one of Australian universities. Also another survey targeting second year university chemistry students has been conducted toward the end of semester one in the same university. The survey instrument used in the study has been designed to collect data on undergraduate students' attitudes toward chemistry, chemistry self-efficacy beliefs and career aspirations. Over 970 year one undergraduate chemistry student participants and over 270 year 2 undergraduate chemistry student participants took part in this first questionnaire survey. Statistical analysis is to be conducted on the data collected. The results of the data analysis will inform the interviews that are to be conducted later in the study.

## Results

Below are some descriptive statistics of some data collected during the study. By the time of the conference, it is expected that more results will be ready for presentation.

**Table 1: Attitude toward chemistry - what do think of chemistry?  
[simple/complicated]**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	100	10.3	10.3	10.3
	2	385	39.6	39.6	49.9
	3	322	33.1	33.2	83.1
	4	141	14.5	14.5	97.6
	5	23	2.4	2.4	100.0
	Total	971	99.9	100.0	
Missing	System	1	.1		
Total		972	100.0		

Scale: 1=least favourable, 5=most favourable

**Table 2: Chemistry self-efficacy beliefs - How well can you solve chemistry problems?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No confidence	21	2.2	2.2	2.2
	Not very confident	143	14.7	15.1	17.4
	Not sure	303	31.2	32.1	49.5
	Quite confident	409	42.1	43.3	92.8
	Very confident	68	7.0	7.2	100.0
	Total	944	97.1	100.0	
Missing	System	28	2.9		
Total		972	100.0		

**Table 3: Career Aspirations - I am planning a career that uses chemistry**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	190	19.5	20.3	20.3
	Agree	318	32.7	33.9	54.2
	No opinion	223	22.9	23.8	77.9
	Disagree	146	15.0	15.6	93.5
	Strongly disagree	61	6.3	6.5	100.0
	Total	938	96.5	100.0	
Missing	System	34	3.5		
Total		972	100.0		

## Conclusions

These initial results seem to indicate that most of the undergraduate chemistry students are intending to pursue chemistry related careers but they are not quite confident with the subject of chemistry. Also, whereas the participants of the study were undergraduate chemistry students, majority believe that chemistry is complicated. In the course of analysis we will be seeking to identify how chemistry self-efficacy beliefs are associated to attitudes towards chemistry and career aspirations.

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