

ATTITUDES OF SECONDARY SCHOOL STUDENTS IN SAUDI ARABIA TOWARDS SCIENCE

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ABSTRACT: *This study aims to investigate secondary school students' attitudes in Saudi Arabia towards science. Questionnaire of 24 items was developed considering a variety of attitudes toward science instruments, and then administrated to a sample of 150 secondary school students (78 males & 72 females). The findings indicated that secondary school students in Saudi Arabia have positive attitudes towards science. At the meantime, the results showed that there was no significant difference in attitudes towards science between males and females. These findings are discussed in the context of science teaching and research. In addition, the results suggest that further research is required to explore how Saudi students' positive attitudes towards science can be used to improve their performance in science.*

KEYWORDS: Secondary School Students, Attitudes towards Science

INTRODUCTION

A significant amount of research in science education is devoted to understanding ways we can improve the quality of science education and increase enrolment in science courses and degrees. One of the key factors in learning science is students' attitudes and the development of positive attitudes toward science can motivate student interest in science education and science-related careers (George, 2006). Definitely, developing a positive attitude toward science is one of the most important goals of the curriculum (Thomas, Koballa, & Crawley, 1985). Attitudes are general characters that stand behind individual's evaluations and emotional feelings. Attitudes arise from human needs and are expressions of people's intellectual processes (Wheeler, Goodale, & Deese, 1974).

The term attitudes toward science must be used to refer to a general, enduring, positive or negative disposition about science (Thomas, et al., 1985). Usually, an attitude consists of three aspects: affective, cognitive, and behavioural (Arnson, Wilson, & Akert, 1994). An affective component consists of an individual's dispositions about the attitude object. A cognitive component is the individual's beliefs or knowledge about the attitude object, and the behavioral component is the individual's predisposition to act toward the attitude object in a particular way (Gall, Gall, & Borg, 2003).

Several studies deal with the definition of attitude towards science in different ways (Simpson and Oliver, 1990). Definition of attitude towards science is ambiguous, but attitude is concept that defines emotional trends in response to affairs, persons, locations, events or ideas. Therefore phrases as "I like science" or "I enjoy science courses" enumerate as attitude (Simpson and Oliver, 1990).

There are many factors that influence attitudes and achievement among secondary school students. Some of the factors are associated with parental background and family environment.

Other factors relate to individual characteristics such as self-concept, locus of control, and achievement motivation. Still other variables are associated with schools influences such as class climate, teachers, and administrative styles (Talton and Simpson, 1985). According to Osborne, Simon, & Collins (2003), Studies have incorporated a range of components in their measures of attitudes to science including: the perception of the science teacher; anxiety toward science; the value of science; motivation towards science; enjoyment of science; the nature of the classroom environment; achievement in science; and fear of failure on course.

As Osborne et al (2003) and Gardner (1995) offered little support for any strong relationship between attitude and achievement. While, Schibeci (1984) indicates a stronger correlation between students attitude toward science and their achievement. In addition, positive attitude towards science can be promoted by instructional congruence speacially in practical work (MdZain, Samsudin, Rohandi, & Jusoh, 2010).

At the meantime, several studies indicate that secondary school students show positive attitudes towards science (Sakariyau, Taiwo, & Ajagbe, 2016; Yunus, & Ali, 2013; & Sarjou, Soltani, Afsaneh, & Mahmoudi, 2012). However, Mavrikaki, et al. (2012) revealed that secondary school students have neutral views about science. On the other hand, the study of White and Harrison (2012) suggested that secondary school students see science as uncreative, and difficult. They do not recognize its study as important for developing transferrable skills such as technical competence, numeracy, analytical and problem-solving.

Gender has been found to have an interactive effect on attitudes and interest in science careers. Female students tend to have more negative attitudes toward science classes and careers than males (Cannon & Simpson, 1985; Weinburgh, 1995). Also female student interest in science and technology content has been found to decline faster than male interest levels by high school (Wells, Sanchez, & Attridge , 2007)

Ogava and Shimode (2008), in their study showed that there was no meaningful difference between girls and boys in attitude toward science. They considered school science important and easy to learn but were opposite to increasing the science content in science curriculum. Trumper (2006) showed that in general, students' interests in science are neutral (neither positive nor negative), however, boys were more interested in science than girls. Chang, Yeung, & Cheng (2009) in their study indicated that boys showed higher learning interests in sustainability issues and scientific topics than girls. However, girls recalled more life experiences about science in life than boys. Anderson (2006) investigated views of 1027 students from central region of Ghana. His results showed that the majority of students believed that science is useful for society and can help to reduce poverty and deprivation in the world. The results also showed that boys are more interested in become scientists than girls. At the same time, Naser, & Soltani (2011) reported that no significant difference between girls and boys in attitude towards science was found. This finding is supported by the results of Sakariyau, et al (2016). However Sarjou et al. (2012) reported that boys were better in their attitudes towards environmental issues.

Few studies have been conducted in Saudi Arabia on aspects of the attitudes towards science. Of those studies, a study conducted by Saif & Asiri (2017) which its findings indicate that there is no significant difference in attitudes towards science between boys and girls. Also, Al-shargi (1988), indicates that secondary school students in Saudi Arabia have negative attitudes towards Science. Science education in Saudi Arabia represents an important issue of every educational policy. On the other hands, it seems that educational system is still unable to attract

the attention of students' attitude towards science and science learning, while one of the major objectives of teaching science at school level is to develop students' attitude towards science. This study aims to contribute to the relatively limited literature on attitudes of secondary school students in Saudi Arabia towards science.

The aim of the study

This study investigated attitudes of secondary school students towards science in Saudi Arabia. Examining students' attitudes towards science, may help in preparing information for planners of science curriculum to identify needs and demands of students in science education. The research questions are:

1. What is the attitudes of secondary school students towards science?
2. Is there any significant difference between male and female students?

METHODOLOGY

Population and Sampling

The population of this study is the third secondary school students . A total of 150 students were chosen as a sample for this study. Of this sample, 78 were boys and 72 were girls. Because boys and girls in Saudi Arabia study in separate schools, boys' sample was chosen from three secondary schools for boys, and girls' sample was chosen from three secondary schools for girls. All the schools are located in Najran city (Saudi Arabia).

Instrumentation and Procedures

The instrument that was used to gather the primary data for the study is a questionnaire. The questionnaire items (24 items) were developed by the author considering a variety of attitudes toward science instruments. Especially, those were successfully employed to explore attitudes of secondary school students towards science in an Arabian context to be applicable to Saudis' respondents. The questionnaire of twenty four items was distributed to 8 university professors in the area of science education. They were asked to examine the questionnaire items. At the same time, the coefficient of 0.85 was considered a highly acceptable indicator of the reliability of this survey. Questionnaires have been distributed to the participants in the academic year 2017/2018, at the beginning of the first semester. All students administrated the questionnaires in week 4 of the semester.

RESULTS

As shown in Table 1, all items related to attitude towards science are above average. The results show that secondary school students in Saudi Arabia have a positive attitude towards science. From all items, the item "Science is one of my favorite subjects." , has the highest average (M=3.93). At the same time, the item " I do not do very well in science." , has the lowest average (M=2.76). For the estimation of attitudes' level, an average of more than 3.25 indicates a high score; an average of 3.25 – 2.50 indicates a moderate score; and an average of less than

2.50 indicates a low score. All the average scores are either high or moderate and there is no low scores.

Table 1. Means and Standard Division of Saudi Secondary School Students' Attitudes towards Science

Rank	Items	M	SD	Estimation
6	I really like science	3.72	1.89	High
7	I have a good feeling toward science	3.66	2.02	High
20	I feel tense when someone talks to me about science	3.00	1.41	Moderate
1	Science is one of my favorite subjects	3.93	1.67	High
24	Science lessons are a waste of time	2.76	1.55	Moderate
2	I really enjoy science lessons	3.92	1.89	High
14	I would like to learn more about science	3.14	1.63	Moderate
19	I like to watch television programs about science	3.01	1.49	Moderate
4	I am sure that I can do well on science tests	3.87	1.91	High
23	I do not do very well in science	2.87	2.21	Moderate
3	I enjoy the challenge of science assignments	3.88	1.77	High
17	Science teachers make science interesting	3.07	1.74	Moderate
16	We do a lot of interesting activities in science class	3.11	1.76	Moderate
18	There is too much to memorize in science classes	3.03	1.82	Moderate
10	Knowledge of science helps me protect the environment	3.22	1.68	Moderate
5	Science classes will help prepare me for college	3.84	1.37	High
13	Learning science is not important for my future success	3.15	1.83	Moderate
9	What I learn in science classes is useful in my everyday life	3.40	1.47	High
15	Science is useful in helping solve everyday life problems	3.12	2.01	Moderate
8	Science will help me understand the world around me	3.41	1.59	Moderate
21	Science has nothing to do with my life outside of school	2.95	1.69	Moderate
12	Knowing science can help me to make better choices regarding my health	3.17	1.71	Moderate
11	A job as a scientist would be interesting	3.21	1.57	Moderate
22	I would like to become a scientist in the future	2.91	1.40	Moderate
The Whole items		3.31	1.71	High

In order to examine differences between male and female students regarding their opinions about each of the components of attitude towards science, t-test was conducted. As shown in table 2, no significant difference was found among participants regarding the gender ($t = 0.48$, $P < 0.05$). So, these score suggest that the participants at all ages were similar in their attitudes toward science.

Table 2: The difference between attitudes towards Science regarding the gender

Gender	n	Mean	SD	t-value	p
Male	78	3.28	1.66	0.48	<0.05
Female	72	3.34	1.76		

DISCUSSION AND CONCLUSION

Findings of this study showed that secondary school students in Saudi Arabia in general show positive attitudes towards science. This finding are similar to the results of the studies of Sakariyau, et al., 2016; and Yunus, & Ali, 2013, which indicates that secondary school students showed positive attitudes towards science. Also, as indicated in the study of Saif & Aseri (2017), elementary school students illustrated positive attitudes towards science, which consistent with the finding of this study. On the other hand, the finding of current study is inconsistent with the result of the studies conducted by Al-shargi (1988), and White and Harrison (2012) which revealed that secondary school students in Saudi Arabia and UK respectively showed negative attitudes towards science.

This study demonstrates that faculty will use an online educational tool such as Blackboard if they perceive it to be useful to them and if they perceive that the technology is easy to use and supports their needs. This study analyzed perceptions of faculty in Saudi Arabia. Perception of faculty internationally may differ as culture impacts the educational delivery system. We intend to extend this study to determine if significant differences exist in an international setting. Also, this study only looked at faculty perception of ease of use and perceived usefulness. We intend to extend this study to determine if significant differences exist in student perceptions as well.

An additional area for investigation is to determine if there are significant differences in the perception of usage and ease of use of the other major educational software packages. A cross-sectional analysis to study compare Blackboard results to the use of Web-CT and e-College is planned.

Students consider Science one of their favorite subjects, and enjoy science lessons and challenge of science assignments. They feel confident to do well in science and they believe that science can help them to understand the world around them. At the same time, students think that science may help them to solve everyday problems. These opinions are crucial and related to the goals of science education.

The results also indicate that there are no significant differences in attitudes towards science between boys and girls. This finding is supported by the study of Saif and Aseri (2017) which suggested similar level of attitudes toward science for both boys and girls. At the meantime, this finding is consisted with the result of Naser & Soltani's study (2011) which shows similar attitudes towards science even for females or males. Moreover, as indicated by Sakariyau, et al. (2016), no significant difference was found between male and female students regarding their attitudes towards science. Such result is clearly consistent with finding of this study.

Without doubt, having positive attitudes towards science will enable students to acquire scientific information in functional manner and help them to understand the scientific concept and principles. Positive attitudes towards science may make students value the role of the science in solving problems, and make students at the same time value the efforts of scientist in studying different issues and problems effecting our lives. The current study suggest that further research is required to explore how Saudi students' positive attitudes towards science can be used to improve their performance in science.

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