

The Attitudes of Science Education Students Toward Chemistry Class

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ABSTRACT

The current research aims to investigate the Science Education students' attitudes toward the chemistry class according to their gender and the type of high school they graduated from. The study employs the scanning model. The current study was conducted in 2015-2016 academic year, spring semester with Pamukkale University, Faculty of Education Classroom Teaching Department students. 78 students who were attending the chemistry class in the first year curriculum participated in the current study. The data collection was conducted using "Attitudes Toward The Chemistry Class Scale" developed by Hançer, Uludağ and Yılmaz (2007). Whether the attitude scores of Classroom teaching students changed according to gender and high school they graduated were tested using independent t-test (independent samples) and one-way ANOVA. As the result of the data analyses it was observed that the students have a positive attitude toward the chemistry class however, these positive attitudes did not vary according to gender or high school graduated from.

Key Words: Attitude, chemistry class, science education, school type, gender.

INTRODUCTION

The place of a country in the international field is determined by the quality of knowledge and its well educated labor force (Hançer, 2005). Technological changes and advancements develop because of physical sciences. Physical sciences have a very important role in the development of science and technology. Therefore, the education of physical sciences is increasing in our day and age (Demirci, 1993). Physics, chemistry, and biology constitute the core of physical sciences. Chemistry investigates the structure of matter, the characteristics of matter and the interaction of matters with each other. The subject areas chemistry investigates varies quite a bit. It examines various events ranging from the structure of animate and inanimate objects to environmental problems up to date. Chemistry is used to define the world around us, explain natural events and explain the cause and effect relation of natural events. Thus, in order to continue our lives we have to give importance to the science of chemistry and thus chemistry education. In chemistry education it is very important that individuals reach knowledge by exploring on their own, and revise their world point of views as they reach new knowledge and develop an eagerness to learn (Sezgin Saf, 2011). In chemistry education students should develop positive attitudes toward chemistry in order

to understand the world, ask meaningful questions, observe and conduct experiments, analyze, and be aware of and be knowledgeable of their responsibilities (İnce Aka and Sert Çıbık, 2015). The attitudes of students toward a class can be defined as their having positive feelings about the lesson, them liking the lesson or having negative feelings toward the lesson or not liking the lesson (İnce Aka and Sarıkaya, 2014). Anderson (1988) defines attitude as an excitement with medium intensity preparing or inclining an individual to respond in the appropriate or inappropriate manner when faced with a special event. Positive attitude toward a class may be observed as participating in the class, asking questions in the class, answering questions and gaining satisfaction (Özçelik, 1998). Determining the current attitudes of the students will enable getting an idea about their future behavior and help to carry out the targeted changes (Nuhoğlu, 2008). Determining the current attitude in students will provide insight on future behavior and help in developing the desired changes (Nuhoğlu, 2008). In order to achieve the desirable outcome it is necessary to know the attitudes of the students. Evidently, it is important to know students' attitudes in order to gain success in education (Meyveci, 1997). It can be said that there is a positive correlation between attitude and academic achievement. If the students' attitudes toward a class is positive then the academic success in that particular class will be high (Sezgin Saf, 2011; Karasakaloğlu and Saracaloğlu, 2009). Cheung (2009), determined that students' attitudes toward the chemistry class is a variable that affects academic success. In their study, Bennet, Rollnick, Green and White (2001) investigated the effect of attitude toward chemistry class and determined that students with negative attitudes have low academic success.

In order to reach the favorable outcome from chemistry education firstly the student attitudes should be measured. It is necessary to determine the attitudes of science education pre-service teachers because classroom teachers will be shaping the future new generations. In the current study, the aim was to determine the science education students' attitudes toward chemistry and to determine whether gender and the type of high school they graduated from affected the outcome. In regard of these aims the current study tried to answer the following questions:

1. Is there a relation between the attitudes of science education students toward the chemistry class and their gender?
2. Is there a relation between the attitudes of science education students toward the chemistry class and the high school type they graduated from?

METHOD

The current study employed the quantitative scanning model. The study was conducted during the 2015-2016 academic year, spring semester. Science Education First-Year Students comprise the universe of the study. The study group consists of 78 Classroom Teaching Department students in Pamukkale University, Faculty of Education attending the chemistry class that takes place in first-year program.

Data Collection Tools

"Attitudes Toward The Chemistry Class Scale" developed by Hançer, Uludağ and Yılmaz (2007) was used as the data collection tool. The scale consists of 16 positive, and 16 negative a total of 32

items. The Cronbach alpha coefficient of the scale was determined as .87 by researchers. The highest score that can be gained from the scale, 160 indicates positive attitudes, the lowest 32 indicates negative attitudes, and 96 indicates neutral attitudes.

Data Analysis

The participants were 61 female and 17 male students. 51 of the students graduated from Anatolian High school, 20 from regular high school, 5 from Teacher Training High school, and 2 from Vocational High school. Moreover, except 1 of the participants all the other participants indicated that they received the chemistry class before. The reliability coefficient Cronbach Alpha was calculated as 0,912 for the current study. In order to determine whether the data showed normal distribution Kolmogorov-Smirnov analysis was conducted and the results showed that the data was normally distributed ($Z=0,746$; $p>0,05$). Moreover, independent samples t-test and one -way - ANOVA were conducted as parametric analyses.

FINDINGS

In the current study, statistical analyses were conducted in order to determine the attitudes of science education students toward chemistry according to their gender and high school type they graduated from.

1. with the intent to answer the sub question " Is there a relation between the attitudes of science education students toward the chemistry class and their gender?" independent t-test (independent samples) analysis was performed. The findings are presented in Table 1.

Table 1: Independent samples t-test findings

	N	X	s	sd	t	p
Female	61	115,656	16,447	76	1,340	0,184
Male	17	109,941	11,573			

As can be interpreted from Table 1, there were no meaningful differences found between genders ($t_{76}=1,340$, $p>0,05$). The mean score of female students were found as 115,656, and the mean score of male students were 109,941.

2. with the intent to answer the sub question " Is there a relation between the attitudes of science education students toward the chemistry class and the high school type they graduated from?" One-Way ANOVA was conducted. The findings are presented in Table 2.

Table 2: One-Way ANOVA analysis findings

	Sum of Squares	sd	Mean Square	F	p
Between groups	189,294	3	63,098	0,251	0,861
Within group	18617,577	74	251,589		
Total	18806,872	77			

As can be interpreted from Table 2 there were no meaningful differences found among the type of high school the students graduated from ($F_{(3,74)}= 0,251, p>0,05$).

CONCLUSION

From the findings of the current study that aimed to determine the attitudes of Science Education students toward the chemistry class and whether there were differences in gender and high school type they graduated from the following conclusions were made:

1. The independent t-test conducted in order to answer the first sub-question revealed no significant differences ($t_{76}=1,340, p>0,05$). The mean score of the female students was calculated as 115,656 and the mean score of the male students was calculated as 109,941. It was found that the mean score of both the female and male students were above the neutral score 96. The means acquired indicate that both the female and the male students have positive attitudes toward the chemistry class.
2. The One-Way ANOVA conducted to answer the second sub-question revealed no significant differences among the high school types the students graduated from ($F_{(3,74)}=0,251, p>0,05$).

The attitudes of the students vary between 72 to 150 points. In general the main mean of the students' attitudes toward chemistry was found as 114,41. This score is above the neutral score 96. The score indicates that Science Education students have a positive attitude toward the chemistry class. It can be said that because all science education students graduated from science or math majors in high school they have positive attitudes toward the chemistry class.

Research on the topic shows that there is a positive correlation between students' liking the class and success (Oral and McGivney, 2011; Altınok, 2005; Şişman, Acat, Aypay and Karadağ, 2011). Thus, it is thought that for the students to be successful in the chemistry class they should have positive attitudes toward chemistry. Further research could investigate whether science education students are successful in chemistry class since they have positive attitudes towards chemistry.

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