

WCES-2011

The reflections of certain social factors concerning science high school students into their attitudes towards physics course

Hülya Pehlivan^{a*}, Pınar Köseoğlu^b

^a Dr., Hacettepe Üniversitesi, Eğitim Fakültesi Eğitim Bilimleri Bölümü e-mail: hulyapeh@hacettepe.edu.tr

^b Yard. Doç. Dr., Hacettepe Üniversitesi, Eğitim Fakültesi OFMA Bölümü Biyoloji Eğitimi A.B.D e-mail: pakbulut@hacettepe.edu.tr

Abstract

This research aims at studying science high school students' attitudes towards physics course in terms of a) their family income levels, b) the amount of money allocated to their education, c) the unit/institution providing them with the money required for their education, d) the place where they receive education, and e) the location where their family reside. The current research was conducted with the students of Ankara Science High School, and 339 students were reached. An attitudes scale of 34 items was employed so as to obtain the data required. The alpha reliability for the scale of attitudes towards physics course was found to be 0.96. The t test was used in the comparison of pairs whereas one directional variance analysis and scheffe test was used in comparing groups larger than pairs in data analyses. In consequence, the statistical data demonstrated that science high school students' attitudes towards physics course did not differ on the basis of a) the amount of money allocated to their education, b) the unit/institution providing them with the money required for their education, c) the place where they received education, and d) the location where their family resided.

© 2011 Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Keywords: Science high school; Physics course; Attitudes towards physics course

1. Introduction

Science is all the attempts at studying the entities and events in a field, making generalisations and reaching principles for them, and predicting what to encounter by making use of all these steps (Kaptan, 1999). Natural sciences, however, are defined as efforts to describe nature and natural events systematically and to predict the events probable in the future (Yenice, 2006). Natural scientists' purpose is to raise individuals who are constructive, creative and are able to think critically, and who can employ the acquired knowledge and skills in daily life, and can see the relations between science and technology (Güldal, Bayram and Şahin, 1999; Deringöl and Çingil-Barış; 2006). The science of physics, which is included in natural sciences, is an important field serving to that purpose.

The science of physics is a field which studies nature and which has a significant role in our understanding the function of natural events. Physics tries to account for any situation in which humans are available or which human brain can perceive. The relevant research studies have shown that certain factors are influential in students' achievement in the topics of physics. The factors are listed briefly as students' mathematical ability, gender, their levels of consciousness development, their problem solving skills, their mistakes for concepts, and their initial concepts (Kızılıçık and Güneş, 2006). Another factor influencing students' achievement in the science of physics is their attitudes towards physics course.

An attitude is the overall evaluations concerning the individual's self, others or other objects, events or problems. The overall evaluations are based on several cognitive, sensorial and behavioural foundations; and have effects on their development, change and formation (Doğan, 2001). Instilling positive feelings and thoughts in students in a field of education like physics, which is based on good knowledge of mathematics, is a desired output in terms of education. The availability of significant relations between students' physics achievement and their attitudes towards physics requires that attitudes should be determined and that canalised into the positive direction. Therefore, this study seeks answers to the question of whether or not Ankara Science High School students' attitudes towards physics course differ in terms of a) the amount of money allocated to their education, b) the unit/institution providing them with the money required for their education, c) the place where they receive education, and d) the location where their family reside.

2. Method

2.1. Research Model

This is a “descriptive” study aiming to t examine science high school students' attitudes towards physics course in terms of several variables.

2.2. Study Group

The current research was conducted with the 339 students of Ankara Science High School, of whom 99 were girls and 240 were boys. The pre-application was performed in Kırklareli Science High School for the purposes of reliability and validity study of the scales, and 159 science high school students participated in the activity. The pre-application was conducted in November 2008 whereas the actual application was performed in March 2009.

2.3. Data Collection Tool

A 34- item scale of attitudes towards physics course was employed so as to obtain the data required. The attitudes scale was developed by the researchers making use of the similar scales. The alpha reliability was found to be 0.96 for the scale.

2.4. Data Analysis

The data coming from the measurement tool were exposed to analyses on computer through SPSS package programme. The t test was used in the comparison of pairs whereas one directional variance analysis and scheffe tests were used in comparing groups larger than pairs in data analyses.

3. Findings and Interpretations

Table 1. Score Averages and Standard Deviations Concerning Science High School Students' Attitudes towards Physics Course On the Basis Of the Amount of Money Allocated to Their Education

Amount of Money	N	\bar{X}	Ss
Low	24	131.96	25.40
medium	221	121.09	25.06
High	94	123.08	29.19
Total	339	122.41	26.35

Table 1 shows the score averages and standard deviations concerning science high school students' attitudes towards physics course on the basis of the amount of money allocated to their education. Whether or not there was a significant difference between the average values was tested through one directional variance analysis, and the following findings were obtained.

Table 2. One Directional Variance Analysis Results Concerning Science High School Students' Attitudes towards Physics Course on the Basis of the Amount of Money Allocated to Their Education

Amount of Money	Sd	Squares total	Squares average	F	p
Intergroup	2	2613.072	1306.536		
Intergroup	336	232223.282	691.141	1.890	.153
Total	338	234836.354			

Table 2 reveals that there are no significant differences between science high school students' scores of attitudes, towards physics course, on the basis of; the amount of money allocated to their education. Based on that, it may be said that the amount of money allocated to students' education do not influence their attitudes towards physics course.

Table 3. Score Averages, Standard Deviations and the t-Values Concerning Science High School Students' Attitudes towards Physics Course On the Basis Of Providing Them with the Money Required for Their Education

Money required for education	N	\bar{X}	Ss	t	p
Provided by family	305	121.67	25.39		
Provided by scholarship	34	129.12	33.54	1.566	.118

According to the findings shown in Table 3, score average of students' attitudes towards physics course is 121.67 for students whose education costs are met by their families whereas it is 129.12 for those who are granted a scholarship. A close examination of Table 3 makes it clear that no significant differences are available between groups; which shows that the students' attitudes towards physics course do not vary on the basis of the unit providing them with money for their education (Source of money)

Table 4. Score Averages, Standard Deviations and the t-Values Concerning Science High School Students' Attitudes towards Physics Course On the Basis Of the Place Where They Receive Education

The place where they receive education	N	\bar{X}	Ss	t	p
At home	133	123.16	27.34		
In dormitory	206	121.93	25.76	.420	.675

According to Table 4, score average of students' attitudes towards physics course is 123.16 for students who receive their education living with their family whereas it is 121.93 for those who receive education away from their family in a students' dormitory. The t-test results show that there are no significant differences between attitudes score averages. The findings obtained reveal that no significant differences are available between the groups in terms of attitudes towards physics course and that they demonstrated similar attitudes.

Table 5. Score Averages, Standard Deviations and the t-Values Concerning Science High School Students' Attitudes towards Physics Course On the Basis of the Place Where Their Families Live

The place of Residence	N	\bar{X}	Ss	t	p
Surban Area	73	124.19	26.31		
Urban Area	266	121.93	26.91	.649	.517

The findings shown in Table 5 demonstrate that the score average of students' attitudes towards physics course is 124.19 for those students with families living in the urban area while it is 121.93 for those with families living in the suburban area. It was concluded from the t-test results that there were no significant differences between students'

attitudes towards physics course on the basis of the place where their families lived. That is to say, whether their families were of urban or suburban origins did not affect their attitudes towards the course.

4. Conclusions and Recommendations

This research aims at studying science high school students' attitudes towards physics course in terms of a) the amount of money required for students' education, b) the unit/institution providing them with the money required for their education, c) the place where they receive education, and d) the location where their family reside. The findings of the research which had been conducted with 339 Ankara Science High School students showed that students' attitudes towards physics course did not differ on the basis of a) the amount of money required for students' education, b) the unit/institution providing them with the money required for their education, c) the place where they received education, and d) the location where their family resided. The analyses also showed that research studies directed to measuring science high school students' sensorial properties were inadequate. Thus, it is believed that qualitative as well as quantitative studies concerning students' sensorial properties and students, teachers, curricula and educational conditions should continue.

References

- Deringöl, Y., Çıngıl-Bariş, Ç. (2006). Yenilenen Fen ve Teknoloji Programlarına Yönelik Sınıf Öğretmenleri ve Sınıf Öğretmen Adaylarının Görüşlerinin Belirlenmesi Üzerine Bir Çalışma. *VII. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi. Bildiriler Kitabı*. Cilt:2 Pp:515-518
- Doğan, M. (2001). Eğitim Fakültelerinde Okuyan Aday Öğretmenlerin Matematiğe Karşı Tutumları. *IV. Fen Bilimleri Eğitimi Kongresi'. Bildiriler Kitabı. Ankara: Milli Eğitim Basımevi*. Pp: 551- 555.
- Güldal, A., Bayram,H., Şahin, F. (1999). "İlköğretim Okullarında Enerji Konusunun Entegrasyon İle Öğretilmesi". *III. Ulusal Fen Bilimleri Eğitimi Sempozyumu. Ankara. Ekim*. 204-208.
- Kaptan, F. (1999). Fen Bilgisi Öğretimi. *İstanbul: Milli Eğitim Bakanlığı Yayınları*.
- Kızılcık, H. Ş. Ve Güneş, B., (2006). Düzgün Dairesel Hareket Konusundaki Kavram Yanılgılarının Üç Aşamalı Test İle Tespit Edilmesi. *VII. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi. Bildiriler Kitabı*. Cilt:2 Pp 941-945.
- Yenice, N. (2006). Öğretmen Adaylarının Fen Bilgisi Laboratuvar Uygulamalarına Yönelik Tutumları ve Başarıları Arasındaki İlişki ve Laboratuvar Şartlarına İlişkin Görüşleri. *VII. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi. Bildiriler Kitabı*. Cilt:2 Pp 597-602