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An analysis of ankara science high school students' attitudes towards biology and their academic self-concepts in terms of some family characteristics

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Abstract

The aim of the study is to analyse the science high schoolers' attitudes towards biology and their academic self-concepts in relation to (a) maternal educational background, (b) maternal employment status, (c)) paternal educational background , (d) paternal employment status. The sample includes a total of 322 Ankara Science high school students. The data were collected through the use of an attitude scale with 32-items, an academic self-concepts scale with eight-items and a demographic information form. Alpha coefficients of two instruments are found to be 0.98 and 0.81, respectively. The findings obtained show that neither mothers' educational background nor their employment status has effects on the subjects' attitudes towards biology and on their academic self-concept. It was also found that fathers' educational background as well as their occupational status does not have any impacts on the participants' attitudes towards biology and on their academic self-concepts.

Keywords: High School, biology course, attitudes, academic self – concepts;

1. Introduction

Biology- which studies the structures, functions and relations of living creatures with each other as well as with the environment- is a continuously developing branch of science; and it keeps affecting individuals and societies to a significant extent in parallel to the improvement in other fields of science. Biology, which was previously influential in industry, agriculture, pharmacy and medicine, today makes considerable contributions to science and technology with its fields such as biotechnology, genetic engineering, ecology, improvement work and with research in the fields of abortion, artificial insemination and test-tube baby studies (Sucuoğlu, 2003; Yenice et. al, 2008).

As a field, biology is a field of science which has the most connections with other branches of science (Çilenti and Özçelik, 1991). It has great importance not only in improving human life but also in comprehending the world of living beings- of which man is also a member- by human beings (Köseoğlu, 2004). The fact that biology gains increasing importance in human life necessitates acquisition of positive affective characteristics about it. The most frequently researched ones of those characteristics are attitudes and academic self concepts.

Attitude consists of positive or negative behaviours towards objects, individuals and issues (Petty and Cacioppo, 1996). Naturally, attitudes influence an individual's choices and behaviours in positive or negative ways. An attitude influenced by past experiences (Fishbein, 1963) emerges as liking or disliking a school subject, participating or

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refusing to participate in activities concerning the subject, or considering the course useful or not useful. Academic self concept is, however, defined as a students' opinion of how skilful he or she is at an academic engagement compared to his or her classmates (Arseven, 1986). It is pointed out that the academic self concept held by an individual is an outcome of past experiences and that it has positive relations with achievement (Demirci, 2006, Nazlıçiçek, 2007; Karasakaloğlu and Saracaloğlu, 2009).

Another factor thought to be influential in students' achievement is the family. Family is the social unit that knows of the child most closely, and is an effective vehicle through which the child gains experience concerning the outer world (Kaiser and Delaney, 1996). The socio-economic status of the family- an important indicator and source of power- is, on the other hand, dependent on the family's level of income, its educational background and the status that the family holds in society Demarest, et al., 1993); and has an impact on the level and quality of education the child is to receive. Özgüven (1974) points out that father and mother's educational backgrounds, family's level of average income, mother's employment status, parents' concord with one another, their concern for the student's achievement in the course, the degree of their understanding the student, their confidence in the student, and the relations holding between the family and the student all affect student achievement. Kaur and Kalaramna (2004) suggest that the socio-economic status of the family and the atmosphere at home have positive effects on social intelligence. It is also presumed that home atmosphere, parents' educational status and their job, the similarities between home culture and school culture, and parents' educational help and support given to the child at home are directly or indirectly influential in a students' achievement (Malkoç, 1993; Çelenk, 2003, Yıldırım, 2006; Oluwatelure, 2008).

A review of field literature has demonstrated that the number of research studies concerning science high schools, science high school students' cognitive and affective properties and socio-economic factors about students' parents is insufficient. Therefore, this study aims to analyse parental factors as well as the effects of those factors on affective properties (that is to say, attitudes towards and academic self concepts for biology course), which are capable of accounting for the 0.25 of the variance in achievement.

2. Method

This research aims at describing a current situation and employs a review model. The study group was composed of Ankara Science High School and   322 students attending this school. A scale of attitudes towards biology course and an academic self concepts scale were used as the tool of data collection. The data obtained were analysed through the SPSS 15.0 package programme on the computer. The t test was used in comparing groups of two with independent groups whereas one directional variance analysis was conducted in comparing groups of more than two.

3. Findings and Interpretations

3.1. Findings Concerning the First Sub-problem

Answers are sought to the question "Do science high school students' attitudes towards biology course and their academic self concept differ according to their mother's educational status?" in the first sub-problem of the research.

Table 1. Score Averages, Standard Deviations and Variance Analysis Results Concerning Science High School Students' Attitudes towards Biology Course and Their Academic Self concepts According to Maternal Educational Background

Mother's education	N	$\overline{x}$	ss	Mother's education	Sd	Squares total	Squares average	F	p
Primary school	76	106.39	26.84	G.A	2	760.84	380.42	.51	.60

High school	76	107.36	26.25	G. İ	319	237155.2	743.43		
University	170	109.88	27.89	total	321	237916			
Total	322	108.46	27.22						
Primary school	76	29.01	4.57	G.A	2	47.80	23.90	.94	.39
High school	76	29.61	4.99	G.İ	319	8082.93	25.34		
University	170	29.96	5.24	Total	321	8130.74			
Total	322	29.66	5.03						

According to Table 1, averages are very similar in the case of averages for attitudes towards biology course according to mother's education. Whether or not there were any significant differences between those average values was tested through one directional variance analysis, and no significant differences were found. In this case, it may be said that maternal educational status is not a factor influential in students' attitudes towards and academic self concepts for biology.

3.2. Findings Concerning the Second Sub-problem

Answers are sought to the question "Do science high school students' attitudes towards biology course and their academic self concept differ according to their mother's employment status?" in the second sub-problem of the research.

Table 2. Score Averages , Standard Deviations and t test Results Concerning Science High School Students' Attitudes towards Biology Course and Their Academic Self concepts According to Mother's Employment Status

Variables	Mother's employment status	N	$\bar{x}$	ss	t	p
Attitudes	Employed	175	108.51	27.53	.037	.45
	Not employed	147	108.40	26.95		
Academic self concept	Employed	175	29.79	5.20	.540	.31
	Not employed	147	29.49	4.84		

Table 2 shows score averages concerning the attitudes of students with working mothers towards biology course and their academic self concepts. Whether or not there were any significant differences between those average values was tested through the t test, and no significant differences were found. Thus, mothers' employment status may be said to have no impacts on students' attitudes towards biology course and their academic self concepts.

3.3. Findings Concerning the Third Sub-problem

Answers are sought to the question "Do science high school students' attitudes towards biology course and their academic self concept differ according to their father's educational background?" in the third sub-problem of the research.

Table 3. Score Averages, Standard Deviations and Variance Analysis Results Concerning Science High School Students' Attitudes towards Biology Course and Their Academic Self concepts According to Paternal Educational Background

Father's education	N	$\overline{x}$	ss	Father's education	Sd	Squares total	Squares average	F	P
Primary school	23	102.35	25.83	G.A	2	3732.575	1866.287		
High school	64	103.06	20.33	G.İ	319	234183.5	743.117	2.54	.08
University	235	110.53	26.28	Top.	321	237916.1			
Total	322	108.46	27.22						
Primary school	23	28.09	5.81	G.A	2	97.10	48.551		
High school	64	29.11	4.98	G.İ	319	8033.64	25.184	1.93	.15
University	235	29.96	4.79	Top.	321	8130.74			
Total	322	29.66	5.03						

On examining score averages concerning students' attitudes towards biology course according to father's educational background shown in Table 3, the averages were found to be very similar. Whether or not there were any significant differences between those average values was tested through one directional variance analysis, and no significant differences were found. Thus, it may be said that paternal educational status is not a factor influential in students' attitudes towards and academic self concepts for biology.

3.4. Findings Concerning the Fourth Sub-problem

Answers are sought to the question "Do science high school students' attitudes towards biology course and their academic self concept differ according to their father's employment status?" in the fourth sub-problem of the research.

Table 4. Score Averages, Standard Deviations and Variance Analysis Results Concerning Science High School Students' Attitudes towards Biology Course and Their Academic Self concepts According to Paternal Employment Status

Father's job	N	$\overline{x}$	Ss	Father's job	Sd	Squares total	Squares average	F	P
Worker	31	99	36.54	G.A	2	3319.44	1659.72	2.26	*.11*
Civil servant	219	110	25.28	G.İ	319	234596.6	743.41		
Self employed	72	107.86	27.89	Top.	321	237916.1			
Total	322	108.46	27.22						
Worker	31	28.06	5.81	G.A	2	86.838	43.42	1.72	.18
Civil servant	219	29.83	4.99	G.İ	319	8043.898	25.216		
Self employed	72	29.81	4.77	Top.	321	8130.736			

| Total | 322 | 29.66 | 5.03 |

Whether or not there were any significant differences between the average values concerning students' attitudes towards biology course according to their father's employment status- which is shown in Table 4- was tested through one directional variance analysis, and no significant differences were found. This is a finding demonstrating that students' attitudes towards biology course and their academic self concepts are not influenced by their father's occupation.

4. Conclusions, Discussion And Recommendations

This research has shown basic findings in relation to science high school students' attitudes towards biology and their academic self concepts. The findings are as what follows:

Ankara Science High School students' attitudes towards biology course and their academic self concept do not differ significantly on the basis of   (a) maternal educational background, (b) maternal employment status, (c)) paternal educational background , (d) paternal employment status. This finding does not seem to be consistent with the ones obtained by Çoban (1998), Aydınlı (1997), Yıldız (1999) and Yılmaz (2006) in research concerning attitudes towards mathematics course and concluding that attitudes towards mathematics rise as the family's level of education and the level of income rise. On the other hand, findings obtained in research conducted by Pehlivan (2010) aiming to determine science high school students' attitudes towards mathematics course and their academic self concepts are parallel to the finding that science high school students' attitudes are not connected with parents' educational background, employment status and income level. In this case it may be said that students are not under external supervision. Besides, it may stem from the fact that those students are a specially and carefully chosen group, that families act consciously whatever their educational and income levels are, and that they expect high level of achievement of their children. Based on those findings, the following suggestions are made in this current research:

1. Based on these findings, it would be better to tackle the properties that can be changed through education rather than dealing with properties that we cannot change through education (such as personality, mother's education and occupation, father's education and occupation, etc...).

2. No matter how well prepared are the educational environments, they are not as effective as desired unless they are supported by families. Therefore, activities to include families in educational process should be planned by school administration, and parents should be persuaded to cooperate with schools in their children's education.

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