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A Comparison of the School Engagement Levels of Science High School Students Who do Sports and do not do Sports

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Abstract

The present study aimed to compare the school engagement levels of science high school students who do sports and do not do sports. The descriptive survey model was employed in the study. A total of 908 student's volunteers studying in three High School in Izmit district of Kocaeli participated in the study. The "School Engagement Scale", which was developed by Arastaman (2006) and confirmed in terms of validity and reliability, was used for this purpose. After calculating the frequency and percentage values of the data obtained from the school engagement scale, Independent Sample t-test and ANOVA test were applied, and post-hoc tests including the Bonferroni test and Tamhane's T2 test were used according to the variance analysis test. The significance level was taken as 0.05. It was determined at the end of the study that while the mean school engagement levels varied significantly depending on the variables of school, gender, year level, economic status and engagement in a sport branch, it did not differ significantly in terms of parental status and number of siblings. The general scale sub-dimension mean values of the variable of doing sports showed that the school engagement level of those who did sports were higher than those who did not. By determining the effect of sports activities on school engagement, the student's engagement to the school can be increased.

Keywords: Physical Activity, School Engagement, Sports Education.

Introduction

Although it is very difficult to mention a precise date for the beginning and end of adolescence, the period between 12 to 20 years of age in general is a process that takes place between childhood and young adulthood and ends with reaching adolescence (Marangoz, 2018). It can be said that during this period a person begins to mature both physically and spiritually. It is the period in which acceptance and independence are gained in the social environment, ideas have different and abstract features, and development is seen in many aspects in human life (Dönmezer, 2001).

During this period, while individuals show cognitive and social changes, they also begin to accept their physical changes. In addition to different feelings and thoughts about individual appearance and features, the development of body images related to their physical structure is also observed (Ceyhan & Can, 2002). One of the most important factors affecting the development of a person is reported to be sports and physical education in this period, when development occurs in many ways simultaneously. Undoubtedly, sports and physical education can mostly be provided within the scope of school education. School is an institution that can provide opportunities for the improvement of personal and social characters of all individuals. School education creates an active environment that covers both the improvement of skills and also competition and social changes (Yarımkaya, 2013).

Sports are closely related to the education of a person. Considering personal development, in particular, they enable individuals to be a balanced, healthy and happy, and to adapt to the society and pass this process in the best way (Duman & Kuru, 2010). Sports, which have an important place in human life and increase the life quality of people, are a significant issue that should be considered in terms of contributing to the development of the individual in the context of both inside and outside school education activities. The positive experiences and motivation about sports in school life enable sports to become regular and an important part of the individual's life in the following years. Thus, the development of physical and psychological health can be continuous (Amman, İkizler & Karagözoğlu, 2000).

An important emotional condition that is considered to be a part of the academic success of students in the educational process is for them to have positive feelings regarding their school engagement and sense of belonging (Furlong & Christenson, 2008). According to Maslow's hierarchy of

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needs, the sense of belonging is considered as one of the five most important needs. Unless this need for belonging is met, learning will not take place (Yılmaz, 2015).

School engagement is defined as the sense of belonging to the school environment, having positive thoughts about education, and keeping positive relations with school staff and other students (Jimerson, Campos & Greif, 2003). What is often meant to be expressed with the concept of school engagement, which is related to the various dimensions of a student's school and academic life, is the student's relationship with the school, school employees and the academic ideals that the school wants to inspire (Maddox & Priz, 2003). In the literature, the concept of school engagement is generally evaluated with five basic contents. These are classroom behaviour, academic performance, participation in extracurricular social activities, interpersonal relationships and school community (Jimerson *et al*., 2003).

The concept of school engagement, which is analysed as a structure that is known to be versatile, was considered by Fredricks, Blumenfeld and Paris (2004) in three different ways including behavioural, affective and cognitive:

1. *Behavioural engagement:* The behavioural dimension includes the performance and behaviours that can be observed with the student's participation in extracurricular social activities such as sports, dance and theatre. Behavioural engagement, which is related to the concept of participation, involves the student's participation in both academic and extracurricular social activities (Fredricks *et al*. 2004).
2. *Affective engagement:* While it includes the positive reactions of students to their teachers, friends and school, it also expresses their engagement in the institution and their willingness to study. In addition to describing the activities in the school, it includes features such as positive emotions, excitement, positive thinking, having curiosity and enthusiasm (Fredricks *et al*., 2004).
3. *Cognitive engagement:* It is defined as students' developing an understanding about what, how and why they do in school (Arastaman, 2006). It includes perceptions about the relationship of school studies with future efforts, the importance given to learning, and creating a personal purpose (Appleton, Christenson, Kim & Reschly, 2006). It is associated with students' psychological investment in the school and their willingness and care to spend the necessary energy for complex and difficult subjects (Arastaman, 2006).

It was determined that students with a sense of school engagement show characteristics such as high academic achievement, participation in extracurricular social activities, school attendance and relationships with multiple social groups in their school (Klem & Connell, 2004).

In order to increase students' school engagement and ensure its continuity, their level of engagement should be determined by their family and educators, and the influence of sports activities, which are considered as one of the factors that can affect this level, should be determined accordingly.

The science high schools covered in this study include three science high schools offering education and training in the central district of Izmit, Kocaeli, Turkey. The 2019 national base scores and the highest percentiles of these high schools are as follows: Kocaeli Science High School, 0.92%; Muammer Dereli Science High School, 1.64%, and; Şehit Özcan Kan Science High School, 2.84%. This study group is one with a special percentile across Turkey. In addition to the course and exam successes of this group, it is wondered how the sports activities they take place in both school teams and out-of-school sports teams affect their level of school engagement. And in the present study that was conducted in line with all this information, it was aimed to compare the school engagement levels of science high school students who do sports and do not do sports.

It is believed that determining the influence of whether these age groups do or not do sports on their school engagement levels will be a source of insight for new studies and make a significant contribution to the literature.

Method

Research Design

The descriptive survey model was used in this study, which aims to determine the comparison of school engagement levels of science high school students according to their participation behaviors in sports activities.

Study Group

The study group was determined according to the convenience sampling method and consisted of first, second, third and fourth year students studying in Muammer Dereli Science High School (SH1), Kocaeli Science High School (SH2), and Şehit Özcan Kan Science High School (SH3) in Izmit district of Kocaeli. A total of 908 students, 472 female and 436 male volunteers including 339 from Muammer Dereli Science High School (SH1), 295 from Kocaeli Science High School (SH2) and 274 from Şehit Özcan Kan Science High School, participated in the study. The demographic characteristics of the study group were presented sequentially.

Table 1 shows that 339 (37.33%) of the students participating in the study are from Muammer Dereli Science High School, 295 (32.48%) from Kocaeli Science High School, and 274 (30.17%) from Şehit Özcan Kan Science High School. Gender of the study group show that 472 (51.98%) of the students participating in the study are female and 436 (48.02%) are male. Year levels of the study group shows that 304 (33.48%) of the students participating in the study are in 1st year, 255 (28.08%) are in 2nd year, 235 (25.88%) are in 3rd year, and 114

Table 1: Frequency and Percentage Values Related to the School, Gender, Year Levels, Parental Status, Number of Siblings Family Economic Status and Doing Any Sports Activity of the Study Group

School	*f*	%
SH1	339	37.33
SH2	295	32.48
SH3	274	30.17
Gender	f	%
Female	472	51.98
Male	436	48.02
Year Level	f	%
1st year	304	33.48
2nd year	255	28.08
3rd year	235	25.88
4th year	114	12.55
Parental Status	f	%
Both are alive	888	97.80
Only the mother is alive	12	1.32
Only the father is alive	8	.88
Number of siblings	f	%
1 child	125	13.76
2 children	548	60.35
3 children	188	20.70
4 or more children	47	5.17
Family Economic Status	f	%
Low	34	3.74
Average	777	85.57
High	97	10.68
Doing Sports Activities	f	%
No, I'm not doing any sports	536	59.03
I'm an athlete affiliated to a sports club	101	11.12
I'm an athlete affiliated to a school sports team	180	19.82
I'm an athlete affiliated both to a sports club and to a school sports team	91	10.02
Total	908	100.0

(12.55%) are in 4th year. Parent-Related of the study group shows that both parents of 888 (97.80%) of the students who participated in the study were alive, while only the mother was alive in the case of 12 (1.32%), and only the father was alive for 8 (0.88%) and that there were no students whose neither mother nor further was alive. Number of siblings of the study group including themselves show that 125 (13.76%) of the students were the single child, 548 (60.35%) were 2 siblings, 188 (20.70%) were 3 siblings, 47 (5.17%) were 4 or more siblings. Family economic status the study group show that 34 (3.74%) of the students participating in the study was low, while it was average for 777 (85.57%), and high for 97 (10.68%).

It was determined in Table 1 that 536 (59.03%) of the students participating in the study did not do any sports, 101 (11.12%) were athletes affiliated to a sports club, 180 (19.82%) were athletes affiliated to a school sports team and 91 of them (10.02%) were athletes affiliated both to a sports club and to a school sports team.

Data Collection Tools

In order to collect data in the research; "Personal Information Forum", "School Engagement Scale" were used.

- Personal Information Forum: In this section, information is provided about the school, gender, year level, parental status, number of siblings, family economic status, and sports activities of the students participating in the study.
- School Engagement Scale: The School Engagement Scale is a 5-point Likert type scale developed by Arastaman (2006) for measuring the school engagement status of students. The scale consists of 27 items and 5 sub-dimensions. The statements in the scale are (1) I do not agree at all, (2) I agree slightly, (3) I agree moderately, (4) I agree strongly, and (5) I agree very strongly. As for the sub-dimensions of the scale, 'internal engagement of the student' comprises Items 1, 2, 3, 4, 5, 6, 7, 8, 9, 'school environment-engagement relationship' comprises Items 10, 11, 12, 13, 14, 15, 'school program-engagement relationship' comprises Items 16, 17, 18, 19, 'school administration-engagement relationship' comprises Items 20, 21, 22, 23, 24, and 'teacher-engagement relationship' comprises Items 25, 26, 27.

Cronbach's Alpha reliability coefficient was used for the reliability analyses of the scale. Cronbach's Alpha is .826 in the sub-dimension of 'internal engagement of the student', .785 for 'school environment-engagement relationship', .756 in 'school program-engagement relationship', .653 in 'school administration-engagement relationship', and .697 in 'teacher-engagement relationship'. The total alpha found was .985 (Arastaman, 2006:67).

Data Collection

After the necessary permissions for the study were obtained from the university and the district national education directorate, the researcher arranged the data collection tools on Google forms. The researcher, who met with the school

principals, requested that the school loyalty scale, which was prepared online, be sent to the students via message from the school system. Necessary explanations were made in the Google form sent from the system and voluntary participation of the students outside of school hours was ensured. Filling out a form took about 15 minutes. The completed scales were examined and those scales that were not fully completed by the students were excluded from the scope of the study.

Data Analysis

The data obtained were analysed with SPSS 25.0 package program. The frequency and percentage values of the data obtained from the school engagement scale used in the study were calculated and determined to show a normal distribution, and then Independent Sample t-test and ANOVA test were applied. The differentiation status of the scores that the students got from the school engagement scale in terms of the gender variable was analysed with independent t-test, while the differentiation status in terms of school, gender, year level, parental status, number of siblings, family economic status, and sports activity was analysed with One Way ANOVA. The Bonferroni test as a Post-Hoc test was used in case of variables whose variance analysis showed equality, while Tamhane T2 test was utilised in case of variables whose variance analysis did not show equality. The significance level is taken as 0.05.

Findings

Findings Related to the Sub-Dimensions of the Study Group's School Engagement Levels

Arithmetic mean (), minimum-maximum scores and standard deviation (SD) values regarding the scores the students got in the measurement tool relating to each dimension of the school engagement levels are presented in Table 2.

As can be seen in Table 2, an analysis of the answers given by the students to the measurement tool shows that the highest mean (=3.60) is in the dimension of teacher-engagement relationship, while the minimum mean (=3.01) is in the dimension of the school program-engagement relationship. As for general mean values, it can be said that the school engagement level is above the mean in the dimensions of student's internal engagement, school environment-engagement relationship, school program-engagement relationship, school administration-engagement relationship, and teacher-engagement relationship.

Table 2: Mean, Minimum-Maximum Score and Standard Deviation Values of School Engagement Level Dimensions

Dimensions	*N*	*Min*	*Max*		*SD*
Student's Internal Engagement	908	1.00	5.00	3.41	.68
School Environment-Engagement Relationship	908	1.00	5.00	3.16	.88
School Program-Engagement Relationship	908	1.00	5.00	3.01	.98
School Administration-Engagement Relationship	908	1.00	5.00	3.58	.82
Teacher-Engagement Relationship	908	1.00	5.00	3.60	.96

Findings Relating to the Sub-Dimensions of the Differentiation Status of the Study Group's School Engagement Levels in Terms of the School Variable

Table 3 presents the results of One Way ANOVA conducted on the differentiation status of the study group's school engagement levels in terms of the school variable.

It was determined according to the mean values of each dimension of school engagement level in Table 3 that the mean values of the SH2 students were higher than those of other high schools in the dimensions of student's internal engagement (=3.48), school environment-engagement relationship (=3.22), school program-engagement relationship (=3.26), school administration-engagement relationship (=3.71), and teacher-engagement relationship (=3.67). In the overall total mean values of the dimensions, it is seen that the highest mean (=3.60) is in the teacher-engagement relationship sub-dimension, while the lowest mean (=3.01) is in the school program-engagement relationship sub-dimension.

In the study, a significant difference in favour of SH2 was found between SH1 and SH2 and between SH2 and SH3 in the school program-engagement relationship sub-dimension ($F=13.88$; $p<0.05$). There was a significant difference in favour of SH2 in between SH1 and SH2 in the school administration-engagement relationship sub-dimension ($F=8.08$; $p<0.05$). And a significant difference was found between SH1 and SH2 in favour of SH2 and between SH1 and SH3 in favour of SH3 in the sub-dimension of teacher-engagement relationship ($F=6.96$; $p<0.05$).

Findings Relating to the Sub-Dimensions of the Differentiation Status of the Study Group's School Engagement Levels in Terms of the Gender Variable

Table 4 presents the results of independent t-test conducted on the differentiation status of the study group's school engagement levels in terms of the gender variable.

An analysis of the mean values of the sub-dimension of school engagement level in Table 4 shows that the mean of females (=3.43) was higher than the mean of males (=3.40) in the student's internal engagement dimension and also in the dimension of school program-engagement relationship (=3.08 vs 2.95), while the mean of females was lower than that of males in the dimensions of school environment-engagement relationship (=3.14 vs 3.18), school administration-engagement

Table 3: Results of One Way ANOVA on the School Variable of the Students' School Engagement Levels

Dimensions	*Groups*	*School*	*N*		*SD*	*F*	*p*	*Significant Difference*
Student's Internal Engagement	1	SH1	339	3.36	.68			
	2	SH2	295	3.48	.71	2.29	.10	
	3	SH3	274	3.41	.64			
		Total	908	3.41	.68			
School Environment-Engagement Relationship	1	SH1	339	3.16	.88			
	2	SH2	295	3.22	.88	1.54	.21	
	3	SH3	274	3.09	.88			
		Total	908	3.16	.88			
School Program-Engagement Relationship	1	SH1	339	2.92	.95			
	2	SH2	295	3.26	.95	13.88	.00*	1<2 2>3
	3	SH3	274	2.87	.99			
		Total	908	3.01	.98			
School Administration-Engagement Relationship	1	SH1	339	3.45	.83			
	2	SH2	295	3.71	.83	8.08	.00*	1<2
	3	SH3	274	3.59	.79			
		Total	908	3.58	.82			
Teacher-Engagement Relationship	1	SH1	339	3.45	.96			
	2	SH2	295	3.67	.98	6.96	.00*	1<2
	3	SH3	274	3.72	.91			1<3
		Total	908	3.60	.96			

p<0.05)
**SH1 Muammer Dereli Science High School.*
SH2: Kocaeli Science High School.
SH3: Şehit Özcan Kan Science High School

Table 4: Results of Independent t-Test on the Gender Variable of the Students' School Engagement Levels

Dimensions	*Gender*	*N*	*X*	*SD*	*Sd*	*t*	*p*
Student's Internal Engagement	Female	472	3.43	.66	906		
.59	.55						
	Male	436	3.40	.71			
School Environment-Engagement Relationship	Female	472	3.14	.85	906	-.57	.56
	Male	436	3.18	.91			
School Program-Engagement Relationship	Female	472	3.08	.90	906	1.99	.05*
	Male	436	2.95	1.05			
School Administration-Engagement Relationship	Female	472	3.57	.81	906	-.31	.75
	Male	436	3.59	.84			
Teacher-Engagement Relationship	Female	472	3.58	.94	906	-.91	.35
	Male	436	3.63	.97			

relationship (=3.57 vs 3.59), teacher-engagement relationship (=3.58 vs 3.63). In the study, a significant difference (p<0.05) was found in favour of female students in school program-engagement relationship dimension, which is one of the sub-dimensions of school engagement level. Accordingly, it can be interpreted that female students adapt more to the school program compared to male students and this affects the level of school engagement.

Findings Relating to the Sub-Dimensions of the Differentiation Status of the Study Group's School Engagement Levels in Terms of the Year Level Variable

Table 5 presents the results of One Way ANOVA conducted on the differentiation status of the study group's school engagement level in terms of the year level variable.

According to the mean of each dimension of school engagement level in Table 5, the dimensions of student's internal engagement (=3.44), school environment-engagement relationship (=3.29), school program-engagement relationship (=3.35), school administration-engagement relationship (=3.83) and teacher-engagement relationship (=3.77) were found to be higher in 1st year students than other groups.

In the study, it was observed that there was a significant difference (F=3.57; p<0.05) between the 1st and 3rd years in favour of 1st years in the sub-dimension of school environment-engagement relationship in the scale of school engagement level. In the sub-dimension of the school program-engagement relationship, there was a significant difference (F=22.88; p<0.05) between 1st and 2nd, 3rd and 4th years in favour of 1st years, and between 2nd and 4th years in favour of 2nd years. A significant difference (F=20.51; p<0.05) was found in the sub-dimension of school administration-engagement relationship between 1st years and 2nd, 3rd and 4th years in favour of 1st years, and between 2nd years and 3rd and 4th years in favour of 2nd years. In the sub-dimension of teacher-engagement relationship, a significant difference (F=7.92; p<0.05) was found between 1st years and 3rd Years in favour of 1st years, and between 2nd years and 3rd years in favour of 2nd years.

Findings Relating to the Sub-Dimensions of the Differentiation Status of the Study Group's School Engagement Levels in Terms of the Parental Status Variable

Table 6 presents the results of One Way ANOVA conducted on the differentiation status of the study group's

Table 5: *Results of One Way ANOVA on the Year Level Variable of the Students' School Engagement Levels*

Dimensions	*Groups*	*Year Level*	*N*		*SD*	*F*	*p*	*Significant Difference*
Student's Internal Engagement	1	1st year	304	3.44	.71	.55	.64	-
	2	2nd Year	255	3.41	.67			
	3	3rd Year	235	3.37	.64			
	4	4th Year	114	3.42	.72			
		Total	908	3.41	.68			
School Environment-Engagement Relationship	1	1st year	304	3.29	.91	3.57	.01*	1>3
	2	2nd Year	255	3.12	.86			
	3	3rd Year	235	3.07	.83			
	4	4th Year	114	3.07	.92			
		Total	908	3.16	.88			
School Program-Engagement Relationship	1	1st year	304	3.35	.99	22.88	.00*	1>2 1>3 1>4 2>4
	2	2nd Year	255	2.98	.94			
	3	3rd Year	235	2.81	.90			
	4	4th Year	114	2.62	.89			
		Total	908	3.0	.98			
School Administration-Engagement Relationship	1	1st year	304	3.83	.82	20.51	.00*	1>2 1>3 1>4 2>3 2>4
	2	2nd Year	255	3.60	.78			
	3	3rd Year	235	3.36	.82			
	4	4th Year	114	3.29	.72			
		Total	908	3.58	.82			
Teacher-Engagement Relationship	1	1st year	304	3.77	.96	7.92	.00*	1>3 2>3
	2	2nd Year	255	3.64	.93			
	3	3rd Year	235	3.37	.95			
	4	4th Year	114	3.59	.95			
		Total	908	3.60	.96			

p<0.05

school engagement level in terms of the parental status variable.

According to the mean values of each dimension of school engagement level in Table 6, the mean of those students whose both parents were alive was higher in the sub-dimensions of student's internal engagement (=3.42) and school environment-engagement relationship (=3.16), while the students with the highest mean in the dimensions of school program-engagement relationship (=3.43), school administration-engagement relationship (=3.86) and teacher-engagement relationship (=3.77) were found to be those who gave the answer that only their mother lived. It can be concluded that the students who did not have a father are higher compared to other groups in the school program, school administration and teacher engagement sub-dimensions. There was no significant difference between the groups.

Findings Relating to the Sub-Dimensions of the Differentiation Status of the Study Group's School Engagement Levels in Terms of the Number of Siblings Variable

Table 7 presents the results of One Way ANOVA conducted on the differentiation status of the study group's school engagement level in terms of the number of siblings variable.

According to the mean of each dimension of school engagement level in Table 7, the mean of those students who were single child was higher in the dimensions of student's internal engagement (=3.52) and school environment-engagement relationship (=3.27), while the mean of those students who were 4 or more siblings was higher in the dimensions of school program-engagement relationship (=3.21), school administration-engagement relationship (=3.77) and teacher-engagement relationship (=3.80). The study found that there was no significant difference between school engagement sub-dimensions. Accordingly, it can be concluded that those students who experienced internal engagement and engagement in the school environment were single child, and they balanced this situation with the school environment.

Findings Relating to the Sub-Dimensions of the Differentiation Status of the Study Group's School Engagement Levels in Terms of the Family Economic Status Variable

Table 8 presents the results of One Way ANOVA conducted on the differentiation status of the study group's school engagement level in terms of the family economic status variable.

Table 6: *Results of One Way ANOVA on the Parental Status Variable of the Students' School Engagement Levels*

Dimensions	*Groups*	*Parental Status*	*N*		*SD*	*F*	*P*
Student's Internal Engagement	1	Both are alive	888	3.42	.68		
	2	Only the mother is alive	12	3.32	.70	.25	.77
	3	Only the father is alive	8	3.29	1.18		
		Total	908	3.41	.68		
School Environment-Engagement Relationship	1	Both are alive	888	3.167	.88		
	2	Only the mother is alive	12	3.166	.48	.56	.57
	3	Only the father is alive	8	2.83	1.06		
		Total	908	3.16	.88		
School Program-Engagement Relationship	1	Both are alive	888	3.01	.97		
	2	Only the mother is alive	12	3.43	.86	1.55	.21
	3	Only the father is alive	8	2.68	1.25		
		Total	908	3.01	.98		
School Administration-Engagement Relationship	1	Both are alive	888	3.57	.82		
	2	Only the mother is alive	12	3.86	.69	.96	.38
	3	Only the father is alive	8	3.37	1.22		
		Total	908	3.58	.82		
Teacher-Engagement Relationship	1	Both are alive	888	3.60	.96		
	2	Only the mother is alive	12	3.77	.70	.51	.60
	3	Only the father is alive	8	3.33	1.46		
		Total	908	3.60	.96		

Table 7: *Results of One Way ANOVA on the Number of Siblings Variable of the Students' School Engagement Levels*

Dimensions	*Groups*	*Number of siblings*	*N*		*SS*	*F*	*p*
Student's Internal Engagement	1	1 Sibling	125	3.52	.71	1.33	.26
	2	2 Siblings	548	3.40	.69		
	3	3 Siblings	188	3.37	.63		
	4	4 or more siblings	47	3.44	.76		
		Total	908	3.41	.68		
School Environment-Engagement Relationship	1	1 Sibling	125	3.27	.91	1.11	.34
	2	2 Siblings	548	3.16	.89		
	3	3 Siblings	188	3.08	.80		
	4	4 or more siblings	47	3.15	.99		
		Total	908	3.16	.88		
School Program-Engagement Relationship	1	1 Sibling	125	3.06	1.05	.81	.48
	2	2 Siblings	548	3.00	.99		
	3	3 Siblings	188	2.97	.86		
	4	4 or more siblings	47	3.21	1.03		
		Total	908	3.01	.98		
School Administration-Engagement Relationship	1	1 Sibling	125	3.60	.89	1.04	.37
	2	2 Siblings	548	3.57	.82		
	3	3 Siblings	188	3.54	.78		
	4	4 or more siblings	47	3.77	.85		
		Total	908	3.58	.82		
Teacher-Engagement Relationship	1	1 Sibling	125	3.58	.98	1.16	.32
	2	2 Siblings	548	3.57	.96		
	3	3 Siblings	188	3.67	.92		
	4	4 or more siblings	47	3.80	.98		
		Total	908	3.60	.96		

According to the mean values of each dimension of school engagement level in Table 8, the mean values of students with high family economic level are high in the student's internal engagement dimension (=3.53), while students with moderate family economic level have higher mean values in the dimensions of school environment engagement relation (=3.18), school program-engagement relationship (=3.04), school administration-engagement relationship (=3.60) and teacher-engagement relationship (=3.63).

In the school engagement scale, there was a significant difference (F=6.78; p<0.05) between the students with low income and high income levels in favour of students with high income levels in the sub-dimension of student's internal engagement, and a significant difference was also observed between the low income and middle income students in favour of middle income students in the sub-dimensions of school environment-engagement relationship (F=4.16; p<0.05) and school program-engagement relationship (F=3.44; p<0.05).

Findings Relating to the Sub-Dimensions of the Differentiation Status of the Study Group's School Engagement Levels in Terms of the Sports Activity Variable

Table 9 presents the results of One Way ANOVA conducted on the differentiation status of the study group's school engagement levels in terms of the sports activity variable.

According to the mean values of the sub-dimension of school engagement level in Table 9, the mean of the students who were athletes affiliated both to a club and to a school team was higher in the student's internal engagement dimension (=3.56) for the sub-dimensions of school environment-engagement relationship (=3.26) and the school administration engagement (=3.56). While the mean of students who are athletes affiliated to a sports club was higher in the school program-engagement relationship dimension (=3.16), the mean of those students who were not interested in any sports branch (=3.65) was higher in the teacher-engagement relationship dimension. Considering dimensions, the lowest

Table 8 : *Results of One Way ANOVA on the Family Economic Status Variable of the Students' School Engagement Levels*

Dimensions	*Groups*	*Family Economy*	*N*		*SS*	*F*	*p*	*Significant Difference*
Student's Internal Engagement	1	Low	34	3.03	.98	6.78	.00*	1<3
	2	Average	777	3.42	.66			
	3	High	97	3.53	.71			
		Total	908	3.41	.68			
School Environment-Engagement Relationship	1	Low	34	2.74	.99	4.16	.02*	1<2
	2	Average	777	3.18	.88			
	3	High	97	3.12	.87			
		Total	908	3.16	.88			
School Program-Engagement Relationship	1	Low	34	2.60	1.08	3.44	.03*	1<2
	2	Average	777	3.04	.97			
	3	High	97	2.97	.95			
		Total	908	3.01	.98			
School Administration-Engagement Relationship	1	Low	34	3.34	1.05	3.22	.05	-
	2	Average	777	3.60	.80			
	3	High	97	3.44	.87			
		Total	908	3.58	.82			
Teacher-Engagement Relationship	1	Low	34	3.46	1.19	2.23	.10	-
	2	Average	777	3.63	.94			
	3	High	97	3.43	.98			
		Total	908	3.60	.96			

$p<0.05$

mean in the dimensions other than teacher-engagement relationship was observed in those students who were not doing any kind of sports.

In the school engagement level scale, there was a significant difference ($F=2.95$; $p<0.05$) in the sub-dimension of teacher-engagement relationship between those who did not do any sports and those who were athletes affiliated to a sports club in favour of those who did not do any sports.

Accordingly, it can be concluded that students who do not do any sports have more teacher engagement, devote their time completely to the to their courses instead of sports, want to increase their participation in the lessons and close their gaps with their teacher. Considering the inter-dimensional mean values, it can also be said that doing any sports will increase students' school engagement levels.

Discussion and Conclusion

In this section, the quantitative data obtained on the school engagement levels of science high school students who do sports and do not do sports are evaluated and discussed by comparing them with relevant literature. In the study, demographic characteristics information form and school engagement scale were used.

As a result of the analysis, the relationships between the school engagement levels and demographic characteristics (school, gender, year level, parental status, number of siblings, family economic status and whether they do sports) of science high school students who do sports and do not do sports were assessed.

The answers given by the students to the measurement tool show that the maximum mean (=3.60) was in the dimension of teacher-engagement relationship, and the minimum mean (=3.01) was in the school program-engagement relationship dimension according to the data of the school engagement scale. Looking at the general mean values, it was observed that school engagement level was above mean in terms of student's internal engagement, school environment-engagement relationship, school program-engagement relationship, school administration-engagement relationship and teacher-engagement relationship dimensions.

When the students' school engagement level was examined in terms of the school variable, it was found that SH2 students' mean values were higher than other science high schools in terms of student's internal engagement, school environment-engagement relationship, school program-engagement relationship, school administration-engagement relationship and teacher-engagement relationship dimensions. Besides, a significant difference was found in favour of SH2 in the sub-dimensions of school program-engagement relationship, school administration-engagement relationship

Table 9: *Results of Independent One Way ANOVA on the Sports Activity Variable of the Students' School Engagement Levels*

Dimensions	*Groups*	*Sports*	*N*		*SS*	*F*	*p*	*Significant Difference*
Student's Internal Engagement	1	No, I don't do sports	536	3.39	.69			
	2	I'm an athlete affiliated to a sports club	101	3.43	.63			
	3	I'm an athlete affiliated to a school sports team	180	3.41	.61	1.66	.17	-
	4	I'm an athlete affiliated both to a club and to a school team	91	3.56	.78			
		Total	908	3.41	.68			
School Environment-Engagement Relationship	1	No, I don't do sports	536	3.13	.88			
	2	I'm an athlete affiliated to a sports club	101	3.23	.90			
	3	I'm an athlete affiliated to a school sports team	180	3.16	.86	.77	.50	-
	4	I'm an athlete affiliated both to a club and to a school team	91	3.26	.94			
		Total	908	3.16	.88			
School Program-Engagement Relationship	1	No, I don't do sports	536	2.98	.96			
	2	I'm an athlete affiliated to a sports club	101	3.16	.98			
	3	I'm an athlete affiliated to a school sports team	180	2.99	.93	1.55	.19	-
	4	I'm an athlete affiliated both to a club and to a school team	91	3.14	1.10			
		Total	908	3.01	.98			
School Administration-Engagement Relationship	1	No, I don't do sports	536	3.59	.81			
	2	I'm an athlete affiliated to a sports club	101	3.55	.84			
	3	I'm an athlete affiliated to a school sports team	180	3.562	.77	.14	.93	-
	4	I'm an athlete affiliated both to a club and to a school team	91	3.56	.99			
		Total	908	3.58	.82			
Teacher-Engagement Relationship	1	No, I don't do sports	536	3.65	.94			
	2	I'm an athlete affiliated to a sports club	101	3.35	1.08			
	3	I'm an athlete affiliated to a school sports team	180	3.62	.89	2.95	.03*	1>2
	4	I'm an athlete affiliated both to a club and to a school team	91	3.57	1.02			
		Total	908	3.60	.96			

and teacher-engagement relationship. As for the literature, Yılmaz (2015), one of the similar studies supporting the current study findings, concluded that there was a significant difference between engagement score and high school type. Contrary to the present study's finding, Can (2008) compared public and private schools and did not find a significant difference according to the mean scores of students' school engagement. Mengi (2011) concluded that there was no

significant difference between school types in terms of school engagement.

When the student school engagement level was analysed in terms of the gender variable in the present study, males' mean values were higher than those of females in the sub-dimensions of school environment-engagement relationship, school administration-engagement relationship and teacher-engagement relationship, while females had higher mean values compared to males in the sub-dimension of student's internal engagement. However, a significant difference was found in favour of female students in the school program-engagement relationship dimension ($p<0.05$). Based on this finding, it can be said that school engagement level shows a significant difference in relation to the gender variable in the sub-dimension of the school program-engagement relationship. In the studies of Arastaman (2009), Ilgar and Parlak (2014), Mengi (2011), Upadyaya and Salmela Aro (2013), which support the current research findings, a significant difference was ascertained in favour of females, that is, it was determined that female students' mean scores of school engagement were higher than those of males, and that female students were more engaged in school compared to male students. On the other hand, Erdoğdu and Yüzbaş (2018), who reached different results from our findings, determined a significant difference in favour of males. Studies showing that the level of school engagement does not differ by gender also exist. Alparslan (2016), Can (2008), Hill and Werner (2006) and Yılmaz (2015) concluded that school engagement level did not differ significantly by gender. Based on these results, it can be said that there is no consensus about the relationship between the gender variable and school engagement. These differential results suggest that, in terms of gender, it may be more helpful to evaluate the concept of school engagement together with different factors.

In the present study, a significant difference ($F=3.\ 57$; $p<0.05$) in terms of the gender variable was observed between the 1st and 3rd years in favour of 1st years in the sub-dimension of school environment-engagement relationship in the scale of school engagement level. In the sub-dimension of the school program-engagement relationship, there was a significant difference ($F=22.\ 88$; $p<0.05$) between 1st and 2nd, 3rd and 4th years in favour of 1st years, and between 2nd and 4th years in favour of 2nd years. A significant difference ($F=20.51$; $p<0.05$) was found in the sub-dimension of school administration-engagement relationship between 1st years and 2nd, 3rd and 4th Years in favour of 1st years, and between 2nd Years and 3rd and 4th Years in favour of 2nd Years. In the sub-dimension of teacher-engagement relationship, a significant difference ($F=7.\ 92$; $p<0.05$) was found between 1st years and 3rd Years in favour of 1st years, and between 2nd Years and 3rd Years in favour of 2nd Years.

According to these findings, it was concluded that there was a significant difference between year levels in the study. In support of these findings, Bellici (2015), Erdoğdu and Yüzbaş (2018), Mengi (2011), Sağlam (2016) and Yılmaz (2015) found a significant difference between year levels. Can (2008), Ilgar and Parlak (2014), who reached different findings from the current study, evaluated the subjects according to the age variable and did not find a significant difference. However, in the research conducted by Alparslan (2016), which supports the findings of the present study, it was concluded that there was no significant difference in school engagement level in terms of grade level.

According to the mean values of each dimension of school engagement level in terms of the parental status variable, the mean of those students whose both parents were alive was higher in the sub-dimensions of the student's internal engagement (=3.42) and school environment-engagement relationship (=3.16), while the students with the highest mean in the dimensions of school program-engagement relationship (=3.43), school administration-engagement relationship (=3.86) and teacher-engagement relationship (=3.77) were found to be those who gave the answer that only their mother lived. No significant difference was found between the groups in terms of the parental status variable.

In terms of the number of siblings variable in the school engagement level scale, the mean of those students who were single child was higher in the dimensions of student's internal engagement (=3.52) and school environment-engagement relationship (=3.27), while the mean of those students who were 4 or more siblings was higher in the dimensions of school program-engagement relationship (=3.21), school administration-engagement relationship (=3.77) and teacher-engagement relationship (=3.80). No significant difference was found between the groups based on the number of siblings variable. Alparslan (2016), Mengi (2011) and Sağlam (2016) who reached results that support our study, found that there was no significant difference between school engagement levels and the number of siblings.

In the school engagement scale, there was a significant difference ($F=6.78$; $p<0.05$) between the students with low income and high income levels in favour of students with high income levels in the sub-dimension of the student's internal engagement, and a significant difference was also observed between the low income and middle income students in favour of middle income students in the sub-dimensions of school environment-engagement relationship ($F=4.16$; $p<0.05$) and school program-engagement relationship ($F=3.44$; $p<0.05$). Similar studies supporting the present study finding were encountered. Arastaman (2009), Bellici (2015), Conshas (2001), Erdoğdu and Yüzbaş (2018) and Osterman (2000) concluded that school engagement level showed a significant difference in terms of the income variable. However, Mengi (2011) and Sağlam (2016) found in their studies that there was no significant difference in terms of the income variable.

In the school engagement level scale of the present study, there was a significant difference (F=2.95; p<0.05) in the sub-dimension of teacher-engagement relationship between those who did not do any sports and those who were athletes affiliated to a sports club in favour of those who did not do any sports. When general scale sub-dimension mean values were analysed, it was determined that those who did sports had higher school engagement levels than those who did not. In the study conducted by Yanık (2017), which is similar to our study, it was determined that the school engagement level of the group that studied at a science high school and never participated in school sports activities in terms of school type was low. Serbest (2019) In his study, which aimed to examine the sense of school belonging of high school students who took part in school teams and to evaluate the differences between them and the students who did not take part, a significant difference was found between the students who took part in the school team and those who did not.

Suggestions

This study took place in Izmit district of Kocaeli province. The Science High Schools selected as study groups were found to be a group with high education and exam success. A similar study can be conducted with a broader population. This study that was made with science high school students can be supported with different high schools in order to make comparisons. Some variables of our study can be increased and their effects can be investigated. Based on this study's conclusion that the students who do sports have a higher level of school engagement, the in-school and out-of-school sports activities of the students can be supported and they can be led to participating in different branches as well. By organising school tournaments, students' school engagement can be increased through sports.

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