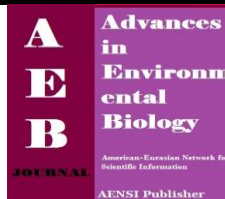




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Pupils' Attitudes for Physical Education Lesson and Science Lesson at Primary Schools: A Comparative Example of Ankara Province

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ABSTRACT

The aim of this study is to examine primary school pupils' attitudes for physical education and science lessons in a comparative and applied fashion. Totally (N=452) primary school pupils participated in our study. Participants were selected randomly. In this applied study, a questionnaire with 5-point likert scale that consisted of two parts for the two lessons was administrated. Data as a result of the study were subject to reliability analysis, and the Cronbach Alpha coefficient was found as 0.921. Kaiser-MeyerOlkin, Barlett's Test of Sphericity analysis, Scree Plotgraph, Factor analysis, Correlation analysis, Tukey, and t-test were applied. It was found that the research was meaningful with Item-Total correlations having a $p < 0.01$ significance level. As a result of the study, it was found that participants performed greater attitudes and importance for science, displayed higher interest and attention towards science lessons, and had thoughts that they will need science lessons more in the future. As for their attitudes for physical education lesson, it was seen that they were lower than those for science lessons. Among the main reasons are ideas and opinions that pupils do insufficient sports activities, sports equipment and materials are insufficient, and sports areas are ineligible for the types they wish to do.

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INTRODUCTION

Attitude is described as the tendency to respond positively or negatively to a certain object [68]. According to Franzi [29], attitude is one's positive or negative evaluation for an object [32].

Attitude is a phenomenon acquired by learning that directs one's behaviors [70]. People learn attitudes later [41]. As pupils' attitudes influence their achievements, they should be understood, improved or changed [26].

Attitudes are related to the control of emotions that occur at time of learning and play an important role in directing human behaviors. Whether the attitude is positive or negative affects learning process directly and shapes the subsequent lives of individuals [13].

Attitude is a mental, emotional and behavioral response to oneself or an object, social issue or event around her/him, or pre-tendency that an individual organizes based on experience, motivation and knowledge [1, 39].

Attitudes can be positive or negative at varying levels. Negative attitudes may reveal itself as a negative belief, behavior, rejection or dislike against an object. Positive attitudes reveals as a positive belief, adoption or sympathy for an object [20]. Attitudes are the tendency to display a behavior and the abstract concepts. Conclusions regarding the direction and level of pupils' attitudes can be made by observing their oral or actual behaviors [55].

Including characteristics such as curiosity and evaluation that promotes one's interest in something; attitudes affect not only whether learning happens, but also one's style of learning [7, 8].

One of the most important variables affecting achievement in a lesson is attitudes for a lesson. Thus, one of the essential goals of parents and teachers should be to improve and increase pupils' attitudes for a lesson positively [69]. Developing a positive attitude for a lesson includes willingness to participate, being satisfied to respond, and acknowledging its value [47, 54]. In a learning environment, there is a positive or negative attitude of pupils for the subject taught. Given the fact that a positive or negative attitude has an impact on learning,

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identifying and evaluating the situations affecting the attitude and taking related measures is required to achieve the desired outcome of education [8].

There has been much research on how pupils' attitudes for a lesson or subject affect their achievement in that lesson or subject. When the relation between learning processes and attitudes is examined, many aspects stand out. These aspects also affect pupil's achievement in the lesson. These are pupil's self-confidence, socio-economic situation of the family, physical situation of the school, gender, age, pupil's motivation level, achievement in the lesson, teacher's attitude, and methods and techniques used in the lesson. The most significant factors are pupil's motivation for success, teacher's attitudes for the lesson, and methods and techniques used in the lesson [15]. Measuring pupils' attitudes is beneficial to make assumptions on their future behaviors, change their attitudes or develop new attitudes, and learn more about their learning preferences [47, 52].

Recent research on education has shown that pupils' attitudes for the lesson, material and teacher have an impact on their achievement in the lesson [38]. Many research studies on the relation between achievement and attitude have indicated that pupils' attitude for a lesson is positively related to their achievement in the lesson [57, 64].

Addressing the issue from a different aspect, the study aims to examine, in a comparative and applied fashion, the pupils' attitudes for science and physical education lessons that are often taught as applied at primary schools.

Pupils' attitudes for science lesson:

Studies on science provide the foundation of innovations and developments in science and technology. Interest in science plays a role in doing research in this field. Science education in Turkey is built on primary schools. Science and technology curriculum requires pupils' perception of their environment, respond appropriately, and develop positive attitudes and values [48].

With ever-increasing scientific knowledge and technological innovations, and obvious integration of science and technology into our life, today's information and technology era regards science and technology education as the key for society's future [10, 50].

Science and technology lesson is integrated in the primary curriculum as the main lesson. Promoting interest and curiosity and developing positive attitudes for the subjects in this lesson will help pupils improve their cognitive skills [45].

Today, growing qualified individuals who have the ability to think scientifically, think, criticize, and question becomes more and more important. In such an environment, apart from the other factors, especially science education plays an important role. Through science and technology lesson, students will be able to develop skills in critical thinking, problem solving and decision making [47].

Science is a lesson that enables the pupil to understand his/her environment and develop scientific-thinking skills [17]. It can be argued that it is directly related to daily life, for various materials, machines and systems are included in the objectives of science and technology lesson. In addition, science enables pupils to become a qualified science literate [67]. Science and technology literacy is the combination of one's scientific skills, attitudes, values, concepts and knowledge [65]. Thus, pupils understand the nature of science and scientific knowledge; solve problems based on main principles, laws and theories of science and technology; and learn to use scientific methods [47].

Individual attitudes begin to shape at early ages. Therefore, primary school has a significant role in developing positive attitudes for science [40]. As a result of surrounding people with misunderstandings, many pupils find science and technology challenging. These misunderstandings negatively affects pupils' tendency and so their academic achievement in science and technology. Hence, it becomes important for pupils to be introduced with and like science and technology and develop positive attitudes for it [47].

The reason why a pupil fails to achieve in science and technology lessons can be insufficient interest in this field and negative attitudes develop for this lesson [25].

Students have a high level of interest in science in Turkey, which is above the OECD average. Attitudes of pupils in Turkey for science are positive [25]. Compared to OECD countries, Turkey ranks the third following Mexico and Portuguese, and Japan ranks the last [49].

There are many factors that determine pupils' attitudes for science. These are teacher, learning environment, peer group, parents and so on [58]. Another variable affecting the attitude for science is teaching style. An effective teaching environment increases positive attitudes for science [56].

Mordi [51], explored attitudes for science in terms of socio-economic situation, pupil's characteristics, school's facilities, and learning and teaching approaches. According to the results of the analysis, the positive impact of socio-economic situation on attitudes for science was found 1%, pupil's characteristics 16%, school's facilities 11%, and learning and teaching styles 41% [15].

Gürkan and Gökçe [36] found that attitudes for science lesson are more positive in 5th grade pupils than those in 8th grade. According to Altınok [4], primary 5th grade pupils' attitudes for science lesson have an impact on achievement motivations [42].

Duru and Savaş [23] suggest that there is a close relationship between pupils' achievement in lessons and their attitudes for education. It was found that pupils who achieved in science lessons also displayed positive attitudes for it [70].

Karaer (2007) found that the attitudes of 8th grade pupils in the central district of Amasya province for science lesson vary significantly according to gender, school, grade in the school report, favorite lesson, additional training center, job they wish to do. Additionally, it was found that there is no meaningful difference between the classes at a given grade [42].

Turhan *et al* (2008) found that there is a strong and positive relationship between 8th grade pupils' achievement in science lesson and their attitudes for science [69].

In the study of Balım *et al*. [11], pupils with positive attitudes for science lessons were found having higher academic achievements. Demirbaş and Yağbasan [18] states that pupils' attitudes impacts achievement with a 27% rate, and that pupils with combined affective and cognitive entry achieved even if the teaching setting was not eligible for them [45].

In a developing world, science lessons beginning at primary school level are of high importance for individuals who are born and grown up in a society and will be in continuous need of scientific knowledge. It is undeniable that driving force of today's fast development is science [31].

Leaving its mark on 20th century, science will continue to play a crucial role in human's life. In our century, all areas of living are surrounded by information and technology. As a practical reflection of science, technology will never decrease people's need for scientific knowledge [6].

It is clear that science education will continue developing with fast changes and developments in the world. Thus, considering the fact that attitudes for the lesson have positive contributions to achievement in it, it will be clearly understood how important it is to identify pupils' attitudes for science and technology.

Pupils' attitudes for physical education lesson:

As an essential part of overall education, physical education lesson enables pupils to learn how to move and learn through movements. The overall aim of physical education and sports lesson is to provide pupils with education through physical activities and reach their optimum movement capacity, and ensure their physical, mental, social and emotional development [46].

Activities in the curriculum should be arranged to develop gradually in the next educational phase, in line with the cognitive levels of pupils. One of the biggest problems of today's children is the lack of sufficient psychomotor and sports activities [72].

Pupils develop attitudes for each lesson. Physical education lesson is one of them. Attitudes for the lesson can be positive or negative. Positive attitudes can facilitate effective performance of the lesson activities and achievement of overall aims and main objectives, or can ensure that pupils will participate voluntarily in various physical activities in the future [59]. Negative attitudes can decrease the lesson's effectiveness; the pupil may not participate in the lesson, may not give importance, or cause problems in the functioning of the lesson [34].

Due to their demographic differences, pupils can develop different attitudes for physical education lesson. Demirhan and Koca [21] found that when attitudes of males and females are compared, males' attitude scores are higher than those of female. Gary and David [30] found females display a more positive attitude than males, and that there is no statistically meaningful difference between males and females in terms of socio-economic situation [35].

In their study on the relation between attitude and free time exercise, Chung and Phillips [14] found significant relations between attitudes for physical education in terms of gender and nationality. Taiwanese students have more positive attitudes than American students [35].

In their study, Subramaniam and Silverman [61] found that pupils' attitudes for physical education are positive, but they differ by the grade. It was stated that as the grade increases, there is a decrease in attitude levels [35].

According to the findings of Altay and Özdemir [3], there is a significant difference in pupils' attitude averages between grades. Hünük [38] observed that there is statistically meaningful difference according to grade levels. It was found that as the grade level increases, attitude score averages decrease. It is seen that there are many factors influencing pupils' attitudes for physical education and sports. In this regard, it can be said that such demographic and socio-economic factors result in difference in terms of pupils' attitudes for physical education and sports. It is proposed that identifying factors that differ in pupils' attitude for physical education and sports is important to achieve the learning and teaching goals as well as effective functioning of the lesson [35].

It appears that effective and active functioning of physical education lesson depends on a healthy and harmonized relation between these factors. Pupils' attitudes are also an important aspect for teacher and curriculum [43].

Lesson teacher also plays a critical role in developing positive attitudes for physical education in pupils. Indeed, teachers developing positive attitudes for the lesson in pupils can ensure effective functioning of the lesson and contribute to the teacher's motivation himself [20]. Thus, overall aims of the lesson can be achieved more easily. This may also ensure that pupils will participate voluntarily in various physical activities in the future [44].

In this scope, in order for pupils to develop positive attitudes for physical education lesson activities and extra-curricular activities, it should be ensured that physical education teachers are provided with in-service training based on new approaches, pupils participate more in extra-curricular activities, and curricular and extra-curricular activities be arranged to meet pupils' expectation [9].

As one of the most important aspects to achieve aims and objectives during an instruction process, use of materials and equipment plays an essential role in physical education lesson. An educational setting with sufficient facilities for physical education lesson is significant for both teacher's and pupils' motivation [27].

In their study with 277 schools in Eastern Anatolian Region, Erhan and Tamer (2009) argued that sports materials and sports halls are insufficient in schools in the province centers. However, given the socio-cultural conditions of the region, it was also found that pupils' attitudes for sports lessons are positive, and females' participation of the lesson is high [27].

In their study where they analyzed 2nd grade pupils' opinions for physical education lesson, Güllü and Korucu (2005) stated that pupils' attitudes for physical education lesson are generally positive [33].

Taşmektepligil *et al.*, [66] found that pupils like physical education lessons. Erkmen *et al.* [28] proposed that physical education and sports lessons at private primary schools are important for pupils, and their attitudes and opinions for the lesson are positive [27].

Tokie (2006) explored Japanese and English pupils' attitudes for physical education and found that pupils of both nationalities display positive attitudes for physical education lesson [27].

Finally, it can be seen that pupils' attitudes for the lesson have impacts on their achievement. In addition, positive attitudes for the lesson ensure that they will achieve its overall aims and objectives more easily. Thanks to positive attitudes, individuals can relate what they learn to their real life and can participate in life-long physical activities. In this regard, it is important to determine pupils' attitudes for this lesson.

Aim, Scope and Method:

In the study with Ankara province population Çankaya, Batıkent, Yenimahalle, Sincan, Keçiören, Altındağ and Etimesgut districts sample 452 people participated in the questionnaire that included questions to measure attitudes for science and technology lesson and physical education lesson as well as demographic characteristics. The study took approximately 128 days. As the questionnaire had not been used before, validity and reliability tests were applied prior to the actual analysis. Following pre-test, reliability results were interpreted considering the Cronbach Alpha coefficient and the coefficient that will be obtained when deducted from the analysis for each variable. As a result of the reliability analysis, 0.861 coefficient was found. This means that the questionnaire to be used in the study is reliable. 7 primary schools were included in the study. During the study 2 pedagogues, 1 psychologist "educational development specialist", 4 physical education specialist, 2 statisticians and 3 consultants were consulted. 1 class teacher, 1 physical education teacher and 1 consultant also participated in the study. Data as a result of the study were subject to reliability analysis, and the Cronbach Alpha coefficient was found as 0.921

During analysis; descriptive statistics, reliability analysis, factor analysis, independent sampling t-test, variance analysis and tukey tests were used.

Questionnaire scale used in the study was based on "İlköğretim II. Kademe Öğrencilerinin Fen ve Teknoloji Dersine ve Fen Dersine Karşı Tutumları" (2nd Grade Pupils' Attitudes for Science and Technology Lesson) developed by "Kaya, H., Büyük, U", Tübbak Journal of Science, Year:2011, Volume:4, Issue:2, p.120-130 / "Fen ve Teknoloji Dersine Yönelik Tutum Ölçeği Geliştirme: İlköğretim 4 ve 5 Sınıf Örneği" (Developing an Attitude Scale for Science and Technology Lesson: 4th and 5th Grade Pupils) developed by "Kenar, İ.", Dumlupınar University Journal of Social Sciences, Issue:34 Year:2012. Questionnaires and scales in these research studies were not used literally, but a study was developed based on the scales and path used.

Data analysis:

Data obtained from the questionnaire were analyzed in PASW 18.0 package program. During analysis; descriptive statistics, reliability analysis, factor analysis, independent sampling t-test, variance analysis and tukey tests were used.

Demographic statistics:

When demographic characteristics of participants are analyzed; it is seen that 38% is female, 62% is male; 25% is single child, 25% is one of two children, 37% is one of three children, 13% is one of four or more children; 35% is at 4th-8th grade, and 65% is at 9th-12th grade. When family income levels are analyzed, it is found that 38% has a family income of 1500-2000 liras, 38% has 2001-2500 liras, and 24% has 2501-3000 liras. 62% of the participants study in private schools, 38% studies in public schools.

Table 1: Demographic variables of participants.

Variables		Frequency	%
Gender	Female	174	38%
	Male	278	62%
Number of Siblings	1	114	25%
	2	111	25%
	3	167	37%
	4 and over	60	13%
Grade	4-8	160	35%
	9-12	292	65%
Family Income	1500-2000	173	38%
	2001-2500	170	38%
	2501-3000	109	24%
School type	Private	282	62%
	Public	170	38%

Implementation and analysis:

As a result of the reliability analysis, as Alpha = 0,921, it can be said that 45 items have particularly high reliability.

Table 2: Reliability analysis of the scale

Cronbach's Alpha	Madde Sayısı
,921	45

Physical education factor analysis:

Factor analysis was applied to physical education items, and below are the results in tables and graphics.

KMO adequacy and Bartlett's Sphericity test:

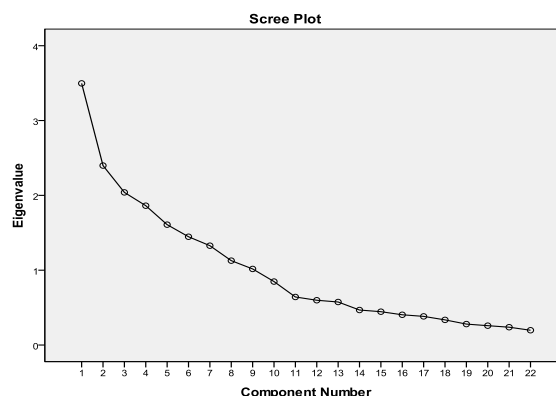
When KMO proficiency test results are analyzed, it is found that as 0.697 is higher than 0.6 threshold value, it is enough to apply factor analysis to the sampling. Bartlett results show that we reject the hypothesis where all the variances are equal, and so at least one variance is different.

Table 3: KMO and bartlett's tests.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,697
Bartlett's Test of Sphericity	Approx. Chi-Square	3167,379
	Df	231
	Sig.	,000

Screeplot:

When screeplot diagram is examined, it is seen that the first component of the factor has the highest eigenvalue, and it explains most of the variance.

**Fig. 1:** Screeplot diagram for the attitudes for physical education lesson.

Determining factor analysis components:

1. Factor: Physical education lessons are not necessary.

One does not make effort to achieve in physical education lessons, for they are seen as waste of time. There is no sufficient hygienic setting and equipment to practice the lesson at the school. These lessons are used not to develop body and personal discipline, but to spend time.

2. Factor: Physical education lessons are fun.

Physical education lessons are fun. They increase analysis capacity and synthesis skills, for they improve people mentally and physically.

3. Factor: Physical education does not provide improvement.

Physical education does not provide improvement in cooperation and collaboration skills, or physical and mental development.

Table 4: Component matrix for the attitudes for physical education lesson.

Items	Component		
	1	2	3
I do not make effort to achieve in physical education lessons.	,669		
I always feel afraid in physical education lessons.	,580		
I see physical education lessons as waste of time.	,577		
I cannot find sufficient setting and conditions at my school to do physical education lessons.	,566		
I think that halls for physical education lessons are not hygienic.	,464		
I use/take physical education lessons only to pass the class.	,418		
I do not think that physical education lessons will be beneficial for me in the future.	,416		
I learn to become disciplined in physical education lessons and increase self-confidence.	-,344		
I participate in physical education lessons only for activity purposes.	,239		
Materials and equipment we use in physical education lessons are insufficient, and they do not have the functions for the activities we wish to do.	,232		
I enjoy physical education lessons and look forward to attend them.		,635	
Thanks to physical education lessons, I improve my analysis and synthesis skills.		,615	
I like to talk about physical education and sports.		,506	
I do not feel proficient for physical education and sports activities.		,493	
I feel bored in physical education lessons.		-,416	
I think that physical education lessons are particularly important and improve one physically and mentally.		,408	
Physical education lessons improve my sense of collaboration with other friends.			-,839
Physical education lessons enable to express myself better and have more self-confidence.			-,727
I attend physical education lessons to hang others.			,619
I do not like the approaches of physical education teachers.			,534
I would like to take another lesson than physical education lesson.			,516
I think that doing sports is beneficial first physically and then mentally.			-,486

Science factor analysis:

Factor analysis was applied to science education items, and below are the results in tables and graphics.

KMO adequacy and Bartlett's Sphericity test:

When KMO proficiency test results are analyzed, it is found that as 0.869 is higher than 0.6 threshold value, it is enough to apply factor analysis to the sampling. Bartlett results show that we reject the hypothesis where all the variances are equal, and so at least one variance is different.

Table 5: KMO and Bartlett's Tests.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,869
Bartlett's Test of Sphericity	Approx. Chi-Square	5037,801
	Df	253
	Sig.	,000

Screeplot:

When screeplot diagram is examined, it is seen that the first component of the factor has the highest eigenvalue, and it explains most of the variance.

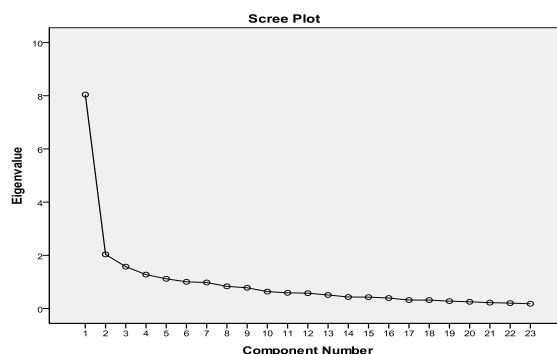


Fig. 2: Screeplot diagram for the attitudes for science lesson.

Determining factor analysis components:

1. Factor: Science and technology lessons are fun.

Science and technology lessons are seen as fun and one enjoys dealing with it. One wishes to take more of these lessons. As interesting and exciting activities are carried out in the lessons, it improves mental and analytical capability. Issues regarding science lessons are often followed and discussed.

2. Factor: Science and technology lessons are challenging.

I am not interested in science and technology, and I do not want to study in this field. Therefore, I feel bored when I deal with it. This results in my failure to achieve in science and technology lessons.

3. Factor: Science and technology lessons are essential.

Science and technology is one of the lessons that I achieve most. It is also included in my daily life. I become successful in these lessons thanks to my interest in them.

Table 6: Component matrix for the attitudes for science lesson.

Items	Component		
	1	2	3
I would like to take more science and technology lessons.	,730		
Science and technology lessons improve me mentally.	,722		
I like to deal with science and technology lessons.	,700		
We learn interesting things in science and technology lesson.	,699		
I like more science and technology lessons than other at the school.	,697		
I solve science and technology problems in my free time.	,695		
I understand everything taught in science and technology lessons.	,667		
I have high grades in science and technology lesson.	,664		
I find science lessons exciting.	,655		
Science and technology lessons play an important role in shaping my future.	,591		
I look forward to science and technology lessons.	,541		
I follow current developments in science and technology lesson.	,486		
I like to discuss issues about science and technology lesson.	,429		
I am not interested in stories about science and technology lesson.		,843	
I do not want to work in a field related to science and technology lesson.		,840	
I am afraid of science and technology lesson.		,729	
I feel bored when studying science and technology lesson.		,705	
I cannot achieve only in science and technology lesson.		,551	
I think that science and technology lesson is not necessary.			-,689
I am not interested in science and technology lesson outside the school.			-,651
I feel helpless when doing homework in science and technology lesson.			-,483
Science and technology lesson is one of the lessons that I achieve most.			,457
Studying science and technology prevents me to think creatively.			-,400

Independent sampling t-test for physical education and science education factors by gender:

H0: There is no difference between physical education and science education factors by gender.

When factors are analyzed by gender; it is found that factors related to 'science and technology lessons are fun', 'science and technology lessons are challenging', and 'physical education lessons are not necessary' vary according to gender. Other factors do not differ by gender.

Independent sampling t-test for physical education and science education factors by class:

H0: There is no difference between physical education and science education factors by class.

When factors are analyzed by class; it is found that not all the factors differ by class.

Table 7: T-test for the lessons (science-physical education) by classvariable

Items	t-test for Equality of Means		
	T	Df	Sig. (2-tailed)
Science and technology lessons are fun.	-2.017	450	.044
Science and technology lessons are challenging.	2.364	450	.018
Science and technology lessons are essential.	.786	450	.433
Physical education lessons are not necessary.	1.904	450	.058
Physical education lessons are fun.	1.832	450	.068
Physical education does not provide improvement.	-.595	450	.552

Table 8: T-test for the lessons (science-physical education) by class variable.

Items	t-test for Equality of Means		
	T	df	Sig. (2-tailed)
Science and technology lessons are fun	1.379	450	.168
Science and technology lessons are challenging.	1.813	450	.071
Science and technology lessons are essential.	-.944	450	.346
Physical education lessons are not necessary.	-.908	450	.364
Physical education lessons are fun.	-.877	450	.381
Physical education does not provide improvement.	.972	450	.331

Independent sampling t-test for physical education and science education factors by school type:

H0: There is no difference between physical education and science education factors by school type.

When factors are analyzed by school type; it is found that 'physical education lesson is not necessary' factor differs by school type. Other factors do not differ by school type. Such factors as lesson materials and methods at public school can affect pupils developing negative attitudes for the lesson. The current system in Turkey where pupils are required to take an exam for occupation selection makes it necessary for them to study for the content of the exam. It can be argued that all these factors affect pupils' perception of physical education lessons as unnecessary. At private schools, family income and facilities provided at the school are remarkable.

Table 9: T-test for the lessons (science-physical education) by school type variable.

Items	t-test for Equality of Means		
	t	df	Sig. (2-tailed)
Science and technology lessons are fun.	-.192	450	.848
Science and technology lessons are challenging.	-1.513	450	.131
Science and technology lessons are essential.	-.777	450	.438
Physical education lessons are not necessary.	2.661	450	.008
Physical education lessons are fun.	-1.862	450	.063
Physical education does not provide improvement.	-.383	450	.702

Independent sampling t-test for physical education and science education factors by family income:

H0: There is no difference between physical education and science education factors by family income.

When factors are analyzed by family income; it is found that 'science and technology lessons are particularly necessary' and 'physical education does not provide improvement' factors differ by school type. According to tukey analysis, those with an income of 1500-2000 liras differ with those with higher incomes.

Table 10: T-test for the lessons (science-physical education) by family income variable.

	F	Sig.	Tukey
Science and technology lessons are fun.	.272	.762	
Science and technology lessons are challenging.	1.878	.154	
Science and technology lessons are essential.	4.523	.000	1-2,3
Physical education lessons are not necessary.	3.845	.000	1-2,3
Physical education lessons are fun.	.871	.419	
Physical education does not provide improvement.	4.689	.000	1-2,3

Correlation analysis:

- There is a correlation between "I cannot find sufficient setting and conditions at my school to do physical education lessons" item and "I do not think that physical education lessons will be beneficial for me in the future" item. ($p = 0.339$)
- There is a positive correlation between "I cannot find sufficient setting and conditions at my school to do physical education lessons" item and "I see physical education lessons as waste of time" item. ($p = 0.224$)
- There is a positive correlation between "I think that halls for physical education lessons are not hygienic" item and "I see physical education lessons as waste of time" item. ($p = 0.157$)

- There is a positive correlation between “I think that halls for physical education lessons are not hygienic” item and “I feel bored in physical education lessons” item. ($p = 0.169$)
- There is a positive correlation between “Materials and equipment we use in physical education lessons are insufficient, and they do not have the functions for the activities we wish to do” item and “I feel bored in physical education lessons” item. ($p = 0.216$)

Table 11: Correlation analysis for physical education lesson.

		I do not think that physical education lessons will be beneficial for me in the future.	I see physical education lessons as waste of time.	I feel bored in physical education lessons.
I cannot find sufficient setting and conditions at my school to do physical education lessons.	PearsonCorrelation	.339	.224	.038
	Sig. (2-tailed)	.000	.000	.423
I think that halls for physical education lessons are not hygienic.	PearsonCorrelation	.070	.157	.169
	Sig. (2-tailed)	.139	.001	.000
Materials and equipment we use in physical education lessons are insufficient, and they do not have the functions for the activities we wish to do.	PearsonCorrelation	.023	.039	.216
	Sig. (2-tailed)	.631	.410	.000

Discussion and Conclusion:

- Most of the participant pupils were males with 2 siblings. They are mostly at 9th-12th grade at a private school. Their family income is 1500-2000 liras.
- According to the results of factor analysis, below are the results for physical education lessons and science and technology lessons.

- Physical education is unnecessary.
- Physical education lessons are fun.
- Physical education does not provide improvement.
- Science and technology lessons are fun.
- Science and technology lessons are challenging.
- Science and technology lessons are essential.

When factors affecting pupils' achievement are evaluated, there has been much research in which achievement and failure is affected by socio-economic situation of the family, educational status of parents, and occupations of parents [73]. In our study, the aim was to evaluate comparatively pupils' attitudes for science and physical education lessons by income, gender, school type and class variables, and related data were interpreted.

Apart from demographic and socio-economic factors, there are many other factors that affect pupils developing attitudes for lessons. Demirhan and Altay [20] underlined that teacher plays a significant role in developing positive attitudes for physical education lesson. Erhan and Tamer [27] argued that the use of lesson facilities and materials in physical education lesson is important for pupil motivation. In our study, negative attitudes for physical education lesson result mostly from teacher, curriculum, equipment and materials. It is known that there have been ongoing problems regarding physical education in Turkey. It is clear that without solutions to problems such as facility, materials and methods through appropriate curriculum and in-service training for teachers, it will be challenging for physical education lesson regarded as a “free lesson” by many pupils to provide positive attitudes.

In our study, it was found that there are positive attitudes for science and technology lesson that is taught as one of the main lessons at school. Kenar and Balcı [47] stated that it becomes increasingly important to grow qualified individuals who have the ability to think scientifically, think, criticize, and question. Laboratories can be seen as one of the most significant factors for science lessons that are taught mostly as applied at schools. It is known that in Turkey, practical classrooms are available at many schools, and lessons are mostly taught as applied. Temizyürek [67] stated that various materials, machines and systems are included in the objectives of science and technology lesson. Science lesson is embedded in life itself. Practical lessons are significant in developing interest and curiosity in pupils for this lesson. Eke [25] underlined that students have a high level of interest in science in Turkey, which is above the OECD average, and display positive attitudes for science. According to MEB-EARGED [49], Turkey ranks third among OECD countries. It also appears that due to the examination system for occupation selection in Turkey, pupils see science and technology as necessary.

Research has shown that there is no difference in primary 1st grade pupils' attitudes for science lesson by gender [4, 5, 24], but as the grade increases, there is difference by gender in favor of males in pupils' attitudes for science [19, 62]. In our study, it was found that there is difference in some items regarding pupils' attitudes by gender. It was seen that “science and technology lessons are fun” and “science and technology lessons are

challenging” items are in favor of female/male pupils. It was also found that female pupils display negative attitudes for “physical education lessons are not necessary” item.

In our study at the comparison related with gender, difference has been found for the benefit of the female students related with “The physical training courses are unnecessary”. It is observed that female students have positive attitude for this article. It can be said that the attitude level of the male students for the physical training courses are higher than the attitude level of the female students concerning with this result. This finding shows similarity with the studies of Balyan (2009), Koca and Demirhan (1998), Stewart and friends (1991), Chung and Philips (2002), Stelzer and friends (2004), Kangalgil and friends (2004), Balyan and friends (2005) and Tekin and friends (2006). The reasons of the low attitudes of the female students to the physical treatment and sports courses may be the high number of the class size; coeducation (Stelzer; 2004), social pressure, locker rooms and hesitation for taking bath [12].

In their study titled “Primary School Students’ Attitudes for Science Lesson”, Gürkan and Gökçe [36] concluded that female students’ attitudes for science lesson are higher than those of male students. In the study of Karaer (2007) which he has searched the attitude of 8th class students for science in terms of various parameters, the result was; the female students have more positive attitude to science than the male students. These findings show parallelism with our study [42].

- When items that differ by gender are analyzed, it is found that “science and technology lessons are fun”, “science and technology lessons are challenging”, and “physical education lessons are not necessary” items differ. It is observed that female students have positive attitude for article “The physical training course are unnecessary”. In their study (1980) Smoll and Schutz has found that the attitude of the male students for physical training courses are more positive than the attitude of the female students [22, 60].

- When items that differ by school type are analyzed, it is found that “physical education lessons are not necessary” item differs. Such factors as facility, lesson materials and methods may result in negative attitudes for physical education lesson at public schools. Compared to public schools, private schools can eliminate many of these negative factors, which results in developing positive attitudes. In their study, Şahin *et al.*, (2010) stated that parents with higher socio-economic levels play a significant role in the education of children studying at private schools and tuition centers [63]. It can be said that the parents who generally prioritize the academical success in these institutions, affect the attitude of the students against science and technology courses. Besides, the participation of the students in primary school grade to physical training course activities is considerably related with the perspective of the mother-father to this subject. The attitude of the parents is almost the most determining factor in the point of participation of their children to these activities. However most of the families do not lean towards the participation of their children to these activities. The idea of the negative effect of the sports on the academic success and disablement reason of the sports which becomes a general view of Turkish society are the main factors for the negative attitude of the parents [53].

- When items that differ by family income are analyzed, it is found that “science and technology lessons are particularly necessary”, “physical education lessons are not necessary”, and “physical education does not provide improvement.” Items differ. In Turkey, expenses for equipment to be used in physical education lessons during curricular and extra-curricular sports activities are received from pupils as sports club fees. Additionally, pupils should wear properly for physical education lessons. While clothing and school fees are not a matter of issue for pupils with higher socio-economic levels, this may be a problem for those with a lower family income level. This is again another factor in developing negative attitudes. This situation can be a factor in the development of the negative attitude. In respect with this subject, Güllü (2007) and Çetin (2007) has determined that there is no such meaningful difference between the monthly income of the families and their attitudes against physical trainings and sports. In our study, some differences are determined that the students whose socio-economical status are in good state, has higher attitude to the necessity of the science and technology courses rather than the physical training courses [32, 16]. Akgün vd., (2007), has determined an increase in the attitude of the students against science courses depending upon the increase of the income of the family [2]. This finding shows parallelism with our study.

- Results of correlation analysis indicate that pupils are discouraged by insufficiency (of materials, methods, facilities, etc.). To increase the sport facilities and materials and to provide the widely usage of the facilities in the activities in-courses and out of courses shall increase the interest to the physical training and sports.

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