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A SURVEY INVESTIGATION OF PRIVATE EXAMINATION CENTRES' CONTRIBUTIONS TO SCIENCE EDUCATION FROM THE STUDENTS' PERSPECTIVE

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ABSTRACT

The present study was conducted at 2 primary public schools and 4 Private Examination Centres (PEC) in Istanbul, Turkey, including three hundred 8th grade students. The survey investigated students' attitudes towards science education in public schools and PECs. The questionnaire contained 48 questions assessing understanding of the concept of "Force" in science lessons. The survey results were analysed using the SPSS package program. The Cranach's Alpha coefficient ranged from 0.713 and 0.821. Contributions of the PECs in elementary science were examined. Reasons behind lower student performance in science education in public school settings were investigated.

Keyword: *Private Education Centre, Quantity and Qualitative, Science Education*

ÖĞRENCİ BAKIŞI İLE ÖZEL DERSHANELERİN FEN BİLGİSİ EĞİTİMİNE KATKISI ÜZERİNE BİR ANKET ARAŞTIRMASI

ÖZ

Bu çalışma, Türkiye'de İstanbul'da 2 devlet ilköğretim okulu ve 4 özel dershanede 8. sınıflara uygulanmıştır. Devlet okullarındaki ve özel dershanelerdeki öğrencilerin fen eğitimindeki tutumları araştırılmıştır. Katılımcılara fen dersinde "kuvvet" kavramı değerlendiren 48 soruluk bir anket uygulanmıştır. Anket sonuçları SPSS paket Programı kullanılarak analiz edilmiştir. Cranach's Alpha güvenirlik katsayısı 0.713-0.821 arasında bulunmuştur. Çalışmada İlköğretimde özel dershanelerin fen eğitimine katkısı ve Devlet okullarındaki fen eğitimindeki başarısızlığın arkasında yatan nedenler araştırılmıştır.

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INTRODUCTION

Historically, the private education system has evolved from private tutoring (Board, 2012; Carpenter and Kafer, 2012) into the classroom setting (Kennedy, 2011). Eventually, this system developed to become the Private Examination Centers (PEC) (Buyukbas, 1997). The role of PECs' in Turkish education system has rapidly increased due to the competitive nature of higher education entrance for high school students. This stems from the fact that there has been a negative balance between the growing number of quality high school graduates and the limited number of higher education institutions that can accommodate the increasing demand for higher education in Turkey. The ratio of students who are entering the higher education entrance process to the number of available slots in higher education institutions has stayed fairly high at around 58 (osym.gow.tr). As a result, an increasingly competitive centralized college entrance examination system has been in place, forcing students to start the preparation process at an earlier stage of their middle school educations. According to exam scores, students are entitled to go to the best high school and university. Since high schools and universities have begun to accept students using the central examination system, demands for PECs have increased (Tansel and Bircan, 2005; meb.gov, 2012). PECs function as a component of the school system in Turkey. PECs are official institutions; however, they are not authorized to awawd diplomas. As in Turkey, PECs are very common in the Far East,in countries such as Japan, Taiwan, and South Korea (Dierkers, 2010). PECs are called by different names in different countries. The most widely known; "yobiko" in Japan (Tsukada, 1988), "cream school" in Taiwan and South Korea (Byun and Park, 2012; Basturk and Dogan, 2011), "shadow school" in USA (Mark, 2010; Buchmann et al., 2010). The goal of PECs is to enable students to pass the entrance examinations for high schools or universities (Bangser, 2008). The common feature of all PECs is that they prepare students to score a higher exam average in order to enter upper class levels. Turkey has one of highest rates of PECs use in the world (Gok, 2005; Ozoglu, 2011). As long as the number of students and the demands for PECs increases, the number of PECs will increase in parallel (Fig.1 and 2). The educational services of PECs prepare students for high school and university entrance exams, serve as additional support for class lessons, provided a place to develop hobbies, and for vocational training courses. Among these, the most prominent goals are university and high school entrance preparation (Basturk and Dogan, 2010; Ozden, 2010). The common feature of the two examinations is that the questions are based on the multiple-choice test technique. Curriculum and education system of schools in Turkey are inadequate. So PECs are supplementing this lack of an exam preparation process. PECs are also available in other countries which very similar targets (Ozoglu, 2011; Kıral, 2009; Turkay, 2013). The last four years in Turkey; according to the results of the SBS exam, science scores have been very low (Fig. 3). In Turkey, the results of the SBS examinations in science education are parallel with the results of the programme for International Student Assessment (PISA). According to the test results in PISA, Turkey's successes in secondary science education are quite low. Turkey is in the last ranks among OECD countries, she is 42th among 65 countries (pisa.meb.gov.tr, 2013).‚As shown in Fig. 3, correct responses to questions in the SBS exam in science various between 35%-40%.

One of the most fundamental concepts and topics in science education is "Force and Motion" in Newton's Physics. Concepts of science education began to emerge in mind

of students at the 8th grade. So force topic in the curriculum at this grade was decided for studying in this work. In this paper, eighth-grade students' attitudes towards science education in public schools and PECs will be examined as well as attitudes about their science teachers. PECs will also be examined. Reasons for the lack of success in science education in public schools will be investigated.

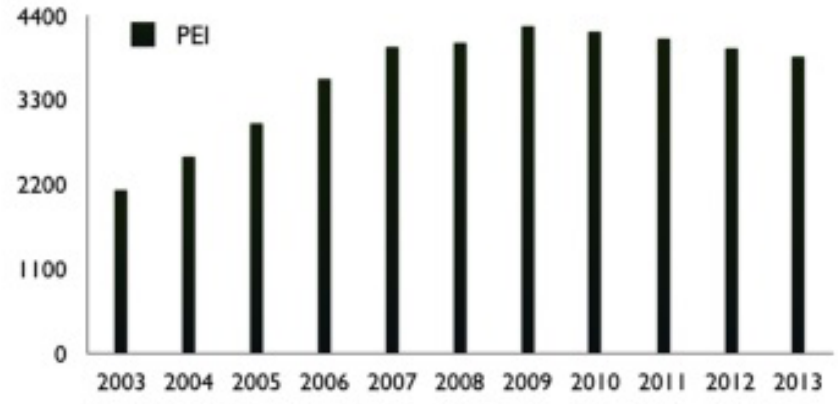

Figure 1. Number of PECs in Turkey (www.egitimekrani.com)

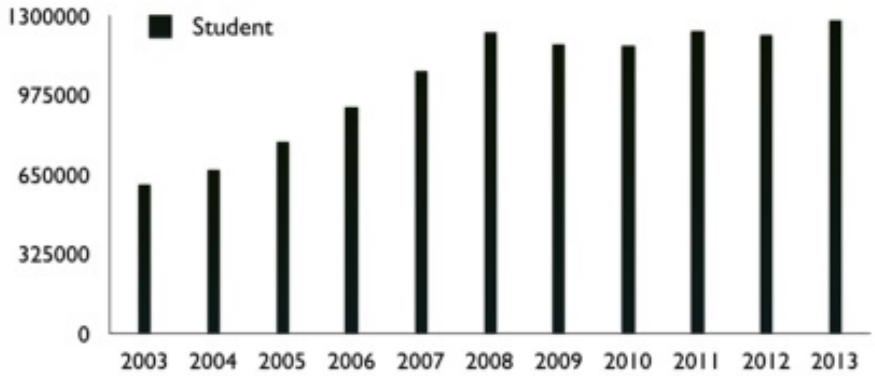

Figure 2. The number of students in PECs (www.egitimekrani.com)

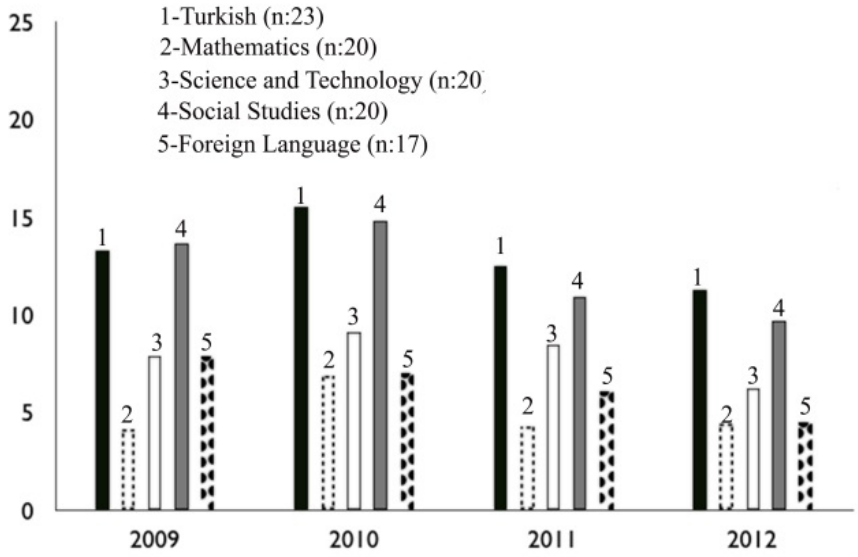

Figure 3. In the SBS (Placement Test) 2012 exam, rates of students answering the questions according to disciplines (meb, 2012). (SBS exam was changed the TOEG exam (Transition from Primary Education to Secondary Education System) in the academic year 2013 -2014)

Purpose of the Study

Different studies about science education and PECs can be found in the literature (Bray, 2006; Basturk and Dogan, 2010; Claudia et.al., 2010; Byun and Park, 2012; Turkay, 2013). However, there has not been found any research study on the contribution of PEC on science education in the literature.

This study identifies six targets to be examined; a) the function and purpose of PECs, b) the attitude of the participants about the public schools and PECs, c) students' attitudes about the science teachers, d) the perception of the participants about science education in public schools and PECs, e) contribution of PECs to science education, f) the reasons for lack of success of science education in public schools.

METHODOLOGY

This study is based on the quantitative methods and yes-no questions.

Participants

The study was performed in Istanbul at two comparable state (public) schools and at four PECs in the same area. Schools and PECs were randomly selected. The surveys were administered to 300 students in the 8th grade. The number of students at the schools and PECs were equal. 12 science teachers were also administered a similar survey. The students' dates of birth are post 2000.

Data Collection

In this study, data were collected quantitatively by asking survey questions and yes-no questions. Five questions are related with the students' reasons for attending PECs, eleven questions are concerned with attitudes of teachers towards to PECs; thirteen questions are connected to the catalytic effects of PECs in science education; thirteen questions are with students' social/personal developments, and motivational effects of PEC; six questions are related with general science education with PECs; and six questions are linked with failure of students in science courses in public schools. Surveys were performed during a three week period, on different days, in equal time intervals. There had unlimited time teachers in answering the questions. The original language of the surveys was Turkish.

Instrument Development

Originally, the appropriate survey questions were prepared to investigate students' attitudes about science education in public schools and PECs. Questions of a vague nature were eliminated; the questionnaires were given after their review by expert. The "Force and motion unit" was selected for the 8th grade. Before the exam, the researcher told the subject in all the classes within the 12 hour period. Surveys were performed to all the participants under the same conditions during a two week period, on different days, in equal time intervals, while teachers had unlimited time to answer the questions. After the data were collected, results were converted to five Likert scales.

Data Analysis

SPSS 16 pocket program was used for analyzing the data. Five-point Likert rating scale is used in the current study. The rating items of the scale are from strongly disagree (1) to strongly agree (5). The score interval on this scale is defined by Kale (2003) as below;

Score Interval= (Highest Score-Lowest Score) /n

For quintet Likert scale; n=5 and for seen Likert scale; n = 7

Data analysis can be classified according to the Likert scale: Disagree (DA) (disagree + strongly disagree) and Agree (A) (agree + strongly agree). Data were analyzed. Arithmetic mean (M) of each question, standard deviation (SD) and percentage of frequency were calculated using–the same program. For internal consistency and reliability, Cronbach's alpha coefficients were calculated and interpreted by the limits of validity.

RESULTS

The qualitative section of this study consists of three parts: 1) students' reasons for going to PECs, 2) quality of teachers in public schools and PECs, 3) PECs contribution to students in science education, 3) comparison of science education between schools and PECs, and 4) students' lack of success in science lessons at public schools.

Five questions were asked to students in order to examine why they attend PECs. Students reported that the main reasons for attending PECs are tradition, insistence by family and friends and to achieve better scores on the central test exams. Cronbach's alpha coefficient for this section questions is 0.821 (Table.1).

Table 1. Reasons students attend PECs

Questions	α=,821 N=300	% of students Agree (A)/Disagree (DA) with each statement			
Q	**Statements**	**Mean**	**SD**	**A**	**DA**
1	It is a tradition to go to PEC in Turkey	1,37	,484	63,08	36,92
2	I started due to my parents' insistence	1,40	,490	60,30	39,70
3	Due to lack of science courses in my school to prepare for the exam	1,11	,313	89,12	10,88
4	If a student does not attend PEC, it is very difficult to be successful in THE exams in the existing system	1,26	,438	74,32	25,68
5	As long as the current education systems in Turkey exist, PECS will maintain their importance.	1,18	,382	82,30	17,70

Table 2. Student attitudes about science teachers in public schools and PECs

Questions	α=,812 N= 300	% of students Agree (A)/Disagree (DA) with each statement			
Q	**Statements**	**Mean**	**SD**	**A**	**DA**
6	explain the subjects better	1,41	,472	57,32	42,68
7	makes the subjects more interesting and are enthusiastic	1,33	,479	69,48	30,52
8	give me helpful feedback chance	1,36	,487	63,37	36,63
9	help me clarify subjects better	1,37	,393	74,7	25,3
10	advise and support my studies better	1,45	,489	48,84	51,16
11	directs me when I need it	1,48	,473	67,36	32,64
12	time table for more efficiency	1,27	,428	79,76	20,24
13	pushes me to study hard	1,41	,483	60,16	39,84
14	Provides many opportunities to practice	1,29	,391	81,92	18,08
15	Teaches the course in a well-organized method and class runs smoothly	1,36	,463	65,13	34,87
16	Provides more sufficient preparation for central exams	1,16	,359	87,32	12,68

Eleven questions were asked to students on the teaching of teachers in order to understand their thoughts about the public school and PECs teachers (Table 2). Students' responses appear at a highly reliable consistency (=0,812).

Table 3. PEC creates the catalyst effect on student in education

Questions	**α=,713 N= 300**	**% of students Agree (A) /Disagree (DA) with each statement**			
Q	**Statements**	**Mean**	**SD**	**A**	**DA**
	PEC……in science courses				
17	increases my motivation, energy and eagerness	1,10	,392	89,72	10,28
18	makes lesson more interesting	1,19	,396	80,74	19,26
19	helps me grasp concepts and ideas	1,42	,476	58,32	41,68
20	makes me want to contribute, be competitive, argumentative	1,34	,473	66,33	33,67
21	makes me creative	1,38	,485	62,36	37,64
22	enables me concentrate more on lesson	1,21	,408	79,08	20,92
23	makes teacher and student more interactive	1,10	,392	86,34	13,66
24	makes lesson more enjoyable, fun and game-like	1,19	,391	90,71	09,29
25	makes lesson more planned and organized	1,23	,424	76,73	23,27
26	provides instant feedback between student and teacher	1,19	,398	88,34	11,66
27	makes learning easier and without stress	1,20	,401	80,07	19,93
28	easier to review the past subjects	1,19	,396	80,72	19,28
29	better attendance	1,28	,451	71,74	28,26

This section is concerned with the function of schools in students learning science (Table 3). Thirteen questions were asked to students in order to examine the contribution to learning, when they attended PECs. Questions 17-21 are related to motivational effects on students and questions 29-32 provided different mix of attitudes-opinions of students. Here, the reliability coefficient is α=0,713.

Table 4. PEC impacts to student in various aspects

Questions	α=,801 N= 300	% of students Agree (A)/ Disagree (DA) with each statement			
Q	**Statements**	**Mean**	**SD**	**A**	**DA**
	PEC improves my.....better than school				
30	personal skills	1,24	,430	75,70	24,30
31	critical skills	1,21	,406	79,30	20,70
32	social skills	1,32	,476	68,30	31,70
33	presentation skills	1,29	,456	70,70	29,30
34	chance to express	1,34	,478	69,34	30,66
35	practical thinking	1,35	,479	64,70	35,30
36	my communication skills				
37	different teaching styles	1,26	,439	74,00	26,00
38	marks at school	1,33	,472	66,70	33,30
39	test experiences	1,14	,358	88,32	11,68
40	test technique	1,19	3,79	86,73	13,27
41	accelerates my learning	1,23	,424	76,76	23,24
42	increase my chances of winning the best high school or university, at the entrance examination	1,23	,422	77,84	22,16

In this part, 13 questions were administrated to participants. They were connected to the effect of personal skills development of students. The others were associated with test techniques for taking exams. Cronbach's alpha coefficient for this section is 0.801 (Table 4).

Table 5. General attitudes of students in PEC education

Questions	α=,792 N= 300	% of students Agree (A)/ Disagree (DA) with each statement			
Q	**Statements**	**Mean**	**SD**	**A**	**DA**
	General overview of education in the PEC				
43	Science teachers in PECs are more qualified than in public school	1,29	,457	74,38	25,62
44	Science teachers in PECs are more experienced than in public schools	1,22	,417	22.11	77.89
45	Test documents in PEC are more various and useful than in school	1,33	,471	67,13	32,87
46	The topics in the curriculum are explained in more detail at PEC than schools.	1,71	,456	70,64	29,36
47	Science teaching at school is based on memorizations, whereas in PECS, it is based on concepts and logic	1,39	,489	61,16	38,84
48	There is no difference in the science education between schools and PEC	1,21	,408	78,82	21,18

The last quantitative result section deals with the comparison of science education in public schools and PECs. Here, the reliability coefficient is α=0, 792 (Table 5).

Table 6. shows why science courses are unsuccessful in their school.

	Questions	Yes	No
1	Are you a successful student in science courses at your school?	36,84	63,16
2	Are you going to PEC because you're unsuccessful in science courses at your school?	19,12	80,88
3	Is the PEC course helpful to your science lessons?	81.93	18,07
4	What do you think science education in unsuccessful at your school	Agree %	Disagree%
Difficult science topics		55,67	44,33
Crowded science class		68,56	31,44
Science lessons aren't supported by experiments		79,43	20,57
I do not like science		22,57	77,43

The questions in Table 6 were asked to students in order to understand the reasons why students in public schools were unsuccessful in science disciplines. Results were presented as percent (Table 6).

FINDINGS AND DISCUSSIONS

Three hundred students at the 8th grade of elementary schools were participated in the survey. The number of students at public schools and PECs are equal. The survey questionnaires were used the five point Likert scale. PECs are an alternative solution for preparing students so as to improve their success rate in the central exams. SBS exam results shows that students, in science discipline, have one of the lowest successes among the five main disciplines (meb, 2012). It also ranks low in the PISA results (pisa.meb.gov.tr, 2013).

The anonymous survey data was analyzed and the results were presented in Tables 1-5. Survey questions were grouped according to their contents.

Questions 1-5 in Table 1 are related to students' reasons for attending PEC school. In their opinion, if they do not attend a PECs, s(he) has very little chance to study at a good high school (Q4). Students reported that it is a family tradition to attend a PEC; family insists they attend there due to insufficient science and technology education at schools. As can be seen, the two mean scores are quite high; especially question 3, which have the highest mean score.

Questions 6-16 in Table 2 are connected with participants' thoughts about science teachers at their schools and PECs. Most of the students reported that science teachers in PECs make more practice on the topics Q14 (81. 92%) and they better prepare students to the central exams (Q16:87. 32). However, public school teachers encourage students more to study hard than PECs' teachers (Q9). These are crucial findings.

Questions, 17-29 in Table 3, focused on students' responses on the contributions of PECs to science education, which were found to be highly positive. There are three positive scores, which are especially high. These important outcomes are realized in questions Q17 (89.72%), Q24 (90.71%) and Q26 (88.34%).

Questions 4-9 in Table 4 are positively related to influence of PECs in students' personal and social development. PECs are quite salient and effective in improving students' characters. According to the students' reports, the functions of the PECs are very important to the development of test taking techniques and experience for the central exams. Here are some important findings with high scores, especially, Q39 (88.32%) and Q40 (86.73%), which have the highest values among the 13 questions.

The responses to questions 43-48 in Table 5 were focused on general attitudes of students in PECs. Science teaching in PECs was determined to be of better quality than that in public schools (Q43) but science teachers were inexperienced in PECs (44). These are surprising findings.

Sixty-three percent of the students failed science courses in public school (Q1, Table 6). But students stated that their reasons for going to the PECs were not due to their failure (Q2). Students reported that the reasons of the unsuccessful in the science discipline in public schools are lack of laboratory experiments (79.43%), inadequate practice on the subject, overcrowding of science classes (68.56 %) and quality of teachers. Despite the unsuccessful of students in science classes, they said that they like science courses (Q4, 77.43%). These findings are extremely important.

For the calculated values in the Tables, for internal consistency and reliability, Cronbach's alpha coefficients range from 0,713 and 0,821.

CONCLUSION

The focus of this study was to investigate the science education at schools and PECs using the quantitative method. The survey questions were applied to the students in order to examine the PECs contribution to science education, while analyzing the pools data. The findings demonstrated that PECs contribute to a significant degree the enhancement of science lessons and increase the scores on central exams for high school entrance. So, four themes emerged from the analysis of the data. The first was reasons for students to attend PECs. According to the participants; it is to gain entrance to a better high school, therefore it is vitally necessary to attend a PECs. The second theme highlighted was that teaching quality of science lessons at both public schools and PECs were questioned by students. Students stated that PECs teachers are more diligent in teaching in science than those in public schools, especially for preparing them for the central test exams. The third theme addressed the effect of PECs on students' characters (eg. personal and social skills). The final theme is mainly related to students' lack of success in science lessons. It is interesting to note that although the majority of students like science lessons, they were unsuccessful. Students attend PECs in order to prepare for the high-stakes science test rather than due to their low achievement in this discipline in theirs schools. In the final theme, the two major reasons for students' lack of success are that discipline is not supported by experiments and practices. PECs' function is to complement the work of public schools in Turkey.

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