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COMPARISON OF PISA 2012-2015 RESULTS WITH TURKEY AND ESTONIA AND FINLAND

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Abstract
In recent years, the PISA International Student Success Assessment Program examinations have proved that Estonia and Finland's achievement in mathematics and reading skills, particularly in science, is well above the OECD average. In this context, it is very important for researchers to examine the results of PISA and to carry out researches that will contribute to the education policy. In light of these researches, our country can catch up with the successful countries. The aim of this study is to demonstrate how Estonia and Finland achieve such a success in the PISA examinations and compare their success with the results of Turkey. The research was conducted through document analysis and interview methods within the context of the case study approach. The study was derived from PISA 2012 and 2015 national assessment reports and semi- structured face-to-face interviews with PISA Country Coordinators of the countries mentioned. Similarities and differences between these two countries and Turkey were determined and a comparative analysis was made. According to the analysis; The success of the PISA of the two countries depends on the factors that they carried out an education system where all schools provide education with the same quality and the duration, they use student-centered teaching, science courses start in primary school, students are forced to take a compulsory examination at the end of each instructional level. At the end of the research, necessary suggestions were presented to Turkey based on the obtained data.

Keywords: PISA exam, success, Turkey, Estonia, Finland.

INTRODUCTION

The Program for International Student Assessment (PISA) program, which is a project of the Organization for Economic Co-operation and Development (OECD), is widely used to compare educational achievements of countries at an international level. The main objective of the PISA is to determine the educational system of the countries and the success of these education systems in the education of individuals. This basic goal sets the criteria how the exams are applied to what is measured by the PISA exams (Yıldırım, Yıldırım, Yetişir and Ceylan, 2013).

PISA results play a very important role in the evaluation of education systems. Findings from such exams can be used to highlight the strengths and weaknesses of existing education-training systems, educational policies, curricula, teaching methods and techniques, and the competences of teachers. PISA is a program developed to determine to what extent the students in the 15-year-old group are educated in particular situations where they may face in today's information society through the education provided to them at least 7 years. The qualification measured by PISA is to see whether

the students have the ability to use the knowledge and skills they possess in real life situations and whether they have the ability to communicate effectively using reasoning and formal learned science and mathematics concepts. The PISA study was implemented in 2000, with emphasis on reading skills. In the second application made in 2003, the field of Mathematics literacy was given, and in 2006 the emphasis was given to the field of Science. PISA has given importance to the reading skills since 2009 and mathematics since 2012. PISA is the most comprehensive educational survey ever made at international level. All the processes of PISA application in Turkey are carried out by the Ministry of National Education.

In the PISA 2012 National Preliminary Report published in 2013, detailed information such as countries' performances, averages and Turkey analysis are included (İleri, Ahısha & Karamustafaoğlu, 2017). In this document, the economic, social and cultural conditions of the participating countries and the situation of the gross domestic product are mentioned. In addition, the situation of schools is evaluated according to the application areas of the courses such as; Science Literacy, Mathematical Literacy and Reading Skills and the results are depicted with graphics and tables. When we look at Table 1, we are unfortunately not among the 20 countries placed at the top.

Table 1: PISA 2012 Country Ranking by Average Points in All Fields

Programme for International Student Assessment (2012)[18]
(OECD members as of the time of the study in boldface)

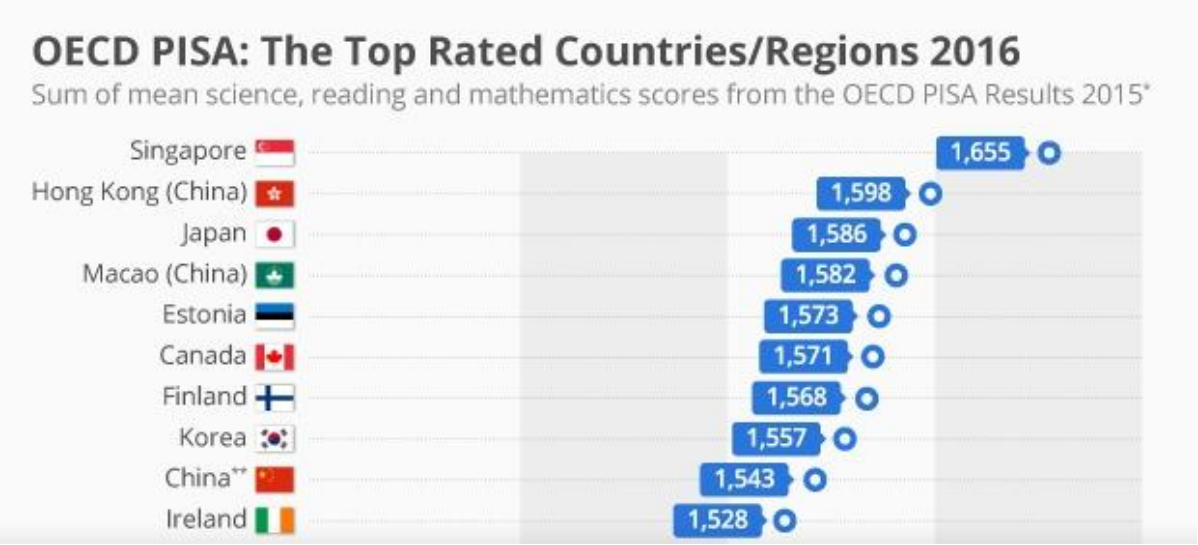
	Maths		Sciences		Reading	
1	Shanghai, China	613	Shanghai, China	580	Shanghai, China	570
2	Singapore	573	Hong Kong, China	555	Hong Kong, China	545
3	Hong Kong, China	561	Singapore	551	Singapore	542
4	Taiwan	560	**Japan**	547	**Japan**	538
5	**South Korea**	554	**Finland**	545	**South Korea**	536
6	Macau, China	538	**Estonia**	541	**Finland**	524
7	**Japan**	536	**South Korea**	538	Taiwan	523
8	Liechtenstein	535	Vietnam	528	**Canada**	523
9	**Switzerland**	531	**Poland**	526	**Ireland**	523
10	**Netherlands**	523	Liechtenstein	525	**Poland**	518
11	**Estonia**	521	**Canada**	525	Liechtenstein	516
12	**Finland**	519	**Germany**	524	**Estonia**	516
13	**Canada**	518	Taiwan	523	**Australia**	512
14	**Poland**	518	**Netherlands**	522	**New Zealand**	512
15	**Belgium**	515	**Ireland**	522	**Netherlands**	511
16	**Germany**	514	Macau, China	521	Macau, China	509
17	Vietnam	511	**Australia**	521	**Switzerland**	509
18	**Austria**	506	**New Zealand**	516	**Belgium**	509
19	**Australia**	504	**Switzerland**	515	**Germany**	508
20	**Ireland**	501	**Slovenia**	514	Vietnam	508

*(URL-1, 2017).

According to the 2012 exam results, it is barely seen that the success of the Far East countries and especially Finland and Estonia from Europe are in the foreground in three areas. When the results of the PISA application held in every three years are examined in 2012, it has been found that Estonia's achievement of mathematics and reading skills, particularly science, is above the OECD average and well above its previous results (Karamustafaoğlu, İleri ve Ahısha, 2016; Maya, 2016; OECD, 2014).

When the results of the PISA application held in every three years are examined in 2015, it has been found out that Estonia's achievement of mathematics and reading skills, particularly science, is above the OECD average and well above its previous results. When the traditional success of Finland is taken into consideration, it is important to compare the success of our country with these countries and it is believed that it will make a positive contribution to Turkey. As seen from Table 2, Estonia and Finland are among the ten most successful countries according to the 2015 PISA results. Therefore, in this study it was aimed to show on what factors the achievements of Estonia and Finland in the PISA exams are based on and to compare their success with Turkey.

Table 2: PISA 2015 Country Ranking by Sum of Average Points in All Fields



METHOD

The research was carried out with the case study which is one of the qualitative research designs and the document analysis and interview methods were used in this context. The case study is a detailed examination of a subject or a special event (Merriam, 1998). Sampling method was used to determine the participants of the research. The purpose of the purposeful sampling is to select the situations with more information that will capture the problems studied in the research (Patton, 2002).

The necessary documentary records were reached and the literature was searched and the education systems of the countries found successful in the PISA exams were reviewed. Interviews were held in Estonia that increased its success in the PISA examinations and in Finland which is known to be successful in the past and increasing its success day-by-day in PISA examinations with the PISA coordinators. Dr. Gunda Tire is the general coordinator of Estonia PISA Exam. Dr. Tire is working at INNOVE, a subdivision institution of the Estonian Ministry of Education and Research. Prof. Dr. Jouni Välijärvi is the general coordinator of the PISA Exam in Finland. Professor Välijärvi is a lecturer at the Jyväskylä University Institute for Educational Research in Finland. Semi-structured interview protocols were formed based on the data obtained after analyzing the documents about the subject and the opinions of the experts. The interviews with the authorities were scheduled within the predetermined date, place and time and each individual interview lasted approximately three hours.

In the direction of the proposed strategies for validity and reliability studies, research findings were presented in a question and answer format without any comments (Creswell, 2008). Interviews were recorded with a voice recorder and data loss was prevented. The validity of the results obtained from the evaluation meetings with the raw interview findings and the researchers who were knowledgeable and experienced instructors in field of education was evaluated.

FINDINGS

A semi-structured interview protocol consisting of 12 questions used in these interviews (Annex-1) was prepared based on the data obtained after the document analysis and the opinions of the experts on the subject and was compiled from the records of the documents related to the subject and interview data. The individual responses of the country coordinators to the second interview questions are presented below as an example and the comparative presentation of the data obtained from the interviews and documents is shown in Table 3.

Question 2: *What sort of studies or projects do you carry in your education policy related to increase the success in PISA?*

Dr. Gunda Tire: We do not implement a specific country-level project or program for the PISA exams. If I need to explain in more detail, there is no specific project carried out in schools in the PISA. As far as I know, no additional studies are conducted in our schools that would increase the success of the PISA exam. The PISA Exam is not a national goal for Estonia. I and my friends see the PISA test only as a survey. Of course, Estonia, PISA or TALIS (the Teaching and Learning International Survey) are important to international research. These exams are considered important because they provide us with an overview of school management, teachers, and the curriculum through the data obtained after their implementation. If the results of the PISA exam are below the OECD average, you will notice that something is missing or incorrect in your education system and curriculum, and a correction is made.

One of the studies in this regard is the introduction of a new system of e-government in Estonia. Schools, students and their families are constantly using this system. All schools are connected to each other through this developed program. Teachers are informed about their students through this system. For example, if the student gets sick, the system will inform the teacher and the teacher will send the student's homework through this system. All families can also follow the grades of their students through using the system.

Dr. J. Valijarvi: The national curriculum is being reorganized. When realizing these studies; we consider the basic competences of the 21st century. New culture of learning, creating new learning environments, happiness of learners, participation in learning, practice-based learning and collaboration are taken into consideration while preparing the new curriculum. The next meeting will be held at the national level with the aim of reviewing the 'August 2016' curriculum and identifying any shortcomings.

Table 3: Comparison of three countries in terms of education and training

Estonia	Finland	Turkey
All schools are connected to each other with electronic system (TIger Leap Program) .	All schools are connected to each other with electronic communication system.	There is an e-school system; schools are not connected to each other.
Pre-school education participation is 93%, although it is not	Despite not being compulsory, pre-school education is great.	The pre-school enrollment rate is 55.48%.

compulsory.		
Compulsory education starts at the age of 7.	Compulsory education starts at the age of 7.	The students who complete 66 months are enrolled to the primary schools
Primary Education has 3-stages. Stage 1: covers 1-3 grades, Stage 2: covers 4-6 grades, Stage 3: covers grades 7-9. This is basic education for 9 years and the curriculum is the same for all schools.	Primary Education is 9 years and the basic curriculum is the same for all schools. Each school has the right to change the curriculum according to the neighborhood.	Compulsory Education has 3 stages and it is 4 + 4 + 4 and total 12 years. The first 4 years is primary school education, the second 4 years is secondary school, and the third 4 years is high school education. In primary school, the curriculum is the same for all schools, and for the second and third four years, the curriculum differs according to the type of school the students attend.
Teachers have the right to choose textbooks. Selected textbooks must be written by Estonian authors and books are provided free of charge by the state.	Teachers have the right to choose textbooks and books are provided by the state free of charge.	The textbooks are prepared by the General Directorate of Education and Education Board of the Ministry of National Education and distributed to all students free of charge.
At the end of 9 years of basic education, every student takes an exam on Estonian language, mathematics, and a third compulsory test chosen by the student's choice.	At the end of 9 years of basic education, every student takes an exam called Matriculation test regardless of their success. Students who succeed in this exam get the right to attend universities.	There is no compulsory examination for graduation after every 4 years of education level in Turkey.
Teachers have master's degree.	Teachers have master's degree.	Master's degree requirement is not necessary for the teachers
The opportunities offered to students all over the country are the same.	The opportunities offered to students all over the country are the same.	The facilities offered to students vary according to the type of environment and school they attend (Sarıer, 2016).
Each student is offered free lunch at school.	Each student is offered free lunch at school.	Free lunch is provided to the students who come from other villages, towns and boarding students also have breakfast, lunch and dinner free of charge
TV programs are broadcast in the original language. Subtitles are translated into Estonian language. Thus, the student's reading culture develops.	TV programs are broadcast in the original language. Subtitles are translated into Finnish. Thus, the student's reading culture develops.	Almost all programs are broadcast on all national TV channels in Turkish.
Every teacher has to attend in-service training conducted by the universities once a year. This training is free for the teachers	Every teacher has to attend in-service training conducted by the universities once a year. This training is free for the teachers.	In Turkey, in-service seminars and workshops are sometimes provided in accordance with the branches and there is no obligation to participate. Such seminars and workshops depend on the demands of the teachers. At the beginning and at end of each academic

		year, teachers are given compulsory education seminars in their schools (Ergin, Akseki ve Deniz, 2012).
The financial expenses of schools are provided by local authorities.	Schools are supported financially by the local governments. Teachers' salaries and school expenses are provided by local authorities.	All expenditures of schools in Turkey are provided by the Ministry of Education and The State Budget (Resmi Gazete, 1973)

DISCUSSION AND CONCLUSION

Based on the research data and the results of the Estonian and Finnish PISA success and the results that can be accepted a source for the failure in our country are presented respectively.

- The education system is decentralized, schools are independent, and school management has unlimited rights to make necessary changes in the curriculum.
- Teachers are required to have at least a master's degree.
- Teachers are free to choose teaching methods and course books in their teaching sessions.
- Almost all students attend kindergarten before they start primary school. The families believe in the importance of pre-school education. Kindergartens follow the national curriculum.
- All schools are connected to each other by using a special network and are supported by active teaching networks.
- The schools offer lunch to all students free of charge.
- Schools employ social pedagogues, speech therapists, psychologists.
- Students grow up independently from their early ages, and if the channels or movies on TV are in original language, it is very important for the students to watch them on the original track and read the subtitles.
- Students participate voluntarily in schools' clubs such as dance, arts education.

In addition, it is crucial to ensure student motivation before the exam; Students are informed about the test and the words such as "Congratulations, you are chosen to represent your country in the PISA exam!", "You are special!", "You are entering the test not only for yourself but also for other students who cannot be selected" motivate the students.

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Annex-1
Interview Protocol

1. Do you think that the teaching environment or/and curriculum has an effect on the success of the students in PISA exams? Can you explain it in detail? (If possible, can you give us the sample of your curriculum?)
2. What sort of studies or projects do you carry in your education policy related to increase the success in PISA?
3. Does in-service training affect the results of the international exams such as PISA? If so, can you explain it?

4. What sort of projects do you carry related to the results obtained from the international exams (PISA) when you compare it with the results of the other countries?
5. Do you inform your students about the PISA exams? How do the students make themselves ready for the exams? Do the students use extra supplementary text books, materials or other sources for PISA?
6. Do you train any special teachers to prepare their students for the PISA? If so, how do you train them or how do these teachers improve themselves?
7. Do you praise your students and teachers or schools related to the success they get from PISA?
8. How do you accept students to the teacher training institutions/colleges/faculties?
9. What is the content of the matriculation exam? What kind of exam is it? What are the steps of the exam?
10. Do you think that the teachers contribute in a way to the success of the students in PISA exam? If so, in what ways do these teachers help students become successful?
11. What are the expectations from you as a PISA coordinator? Do you think how your performance reflects to the following PISA national results?
12. As a whole, what can you say about the success you have got from PISA up to now?

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Dr. Orhan KARAMUSTAFAOĞLU graduated from physics department of METU in 1993. He is specialized on physics education, science teaching practice, teaching methods and teacher education in physics and science. He is still a full Professor Doctor at Amasya University, Education Faculty, Department of Maths & Science Education. He became the President of Turkish Science Education and Research Association –TSERA-. He published 6 books on science education with co-authors printed in Turkish. He has carried out many national scientific projects. He is an editor, vise-editor, member of advisory board, member of scientific board and referee in many international and national scientific journals. He also has national and international papers and proceedings.

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REFERENCES

Creswell, J.W. (2008). Educational research: planning, conducting and evaluating quantitative and qualitative research (3nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Ergin, İ., Akseki, B. & Deniz, E. (2012). İlköğretim okullarında görev yapan sınıf öğretmenlerinin hizmet içi eğitim ihtiyaçları. *Elektronik Sosyal Bilimler Dergisi*, *11*(42), 55-66.

İleri, T., Ahısha, A.R. & Karamustafaoğlu, O. (2017). PISA başarısı nelere bağlı? Estonya örneği, *Eğitim ve Öğretim Araştırmaları Dergisi*, *6*(1), 1-10.

Karamustafaoğlu, O., İleri, T. & Ahısha, A.R. (2016). *PISA hakkında uluslararası görüşmeler.* [Ed. Çepni, S.] PISA ve TIMSS Mantığını ve Sorularını Anlama içinde (s. 267-287). Ankara: Pegem Akademi.

Maya, İ. (2016). Educational indicators influencing countries' achievements according to programme for international student assessment results, *Turkish Studies*, 11(3), 1665-1684.

MEB -Milli Eğitim Bakanlığı- (2015). *Milli Eğitim Bakanlığı basın bildirisi. OECD'nin PISA projesine Türkiye'nin katılımı*. [http://www.meb.gov.tr/duyurular/duyurular/pisa/pisaraporu.htm], Erişim tarihi:15 Mart 2015.

Merriam, S. B. (1998). *Qualitative research and case study applications in education*. Revised and expanded from case study research in education. San Francisco: Jossey-Bass Publishers.

OECD (2014). *PISA 2012 Results in Focus: What 15-year-olds know and what they can do with what they know*. OECD Programme for International Student Assessment.

Sarıer, Y. (2016). Türkiye'de öğrencilerin akademik başarısını etkileyen faktörler: Bir meta-analiz çalışması, *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, *31*(3), 609-627.

URL-1, (2017). The figure was retrieved from https://arstechnica.co.uk/science/2015/06/pisas-worldwide-education-rankings-are-dogged-by-sloppy-duplicated-responses, at 20.01.2017

URL-2, (2017). The figure was retrieved from https://www.statista.com/chart/7104/pisa-top-rated-countries-regions-2016 at 20.01.2017

Patton, M.Q. (2002). Qualitative evaluation and research methods. (3rd ed.). London: Sage Publications.

Resmi Gazete, (1973). Milli eğitim temel kanunu. *Kanun Numarası*, *1739*.

Yıldırım, H.H., Yıldırım, S., Yetişir, M.İ. & Ceylan, E. (2013). *PISA 2012 Ulusal Ön Raporu*, Millî Eğitim Bakanlığı Yenilik ve Eğitim Teknolojileri Genel Müdürlüğü, Ankara.