ResearchGate

See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/284179267

Transformation of Turkish Vocational and Technical Education

Article · December 2013

CITATIONS
2

READS
426

1 author:



Serkan Aydin
Marmara University
27 PUBLICATIONS **50** CITATIONS

SEE PROFILE

All content following this page was uploaded by Serkan Aydin on 19 November 2015.

The user has requested enhancement of the downloaded file.

Transformation of Turkish Vocational and Technical Education

Serkan Aydin

Vocational School of Technical Sciences, Marmara University, Istanbul, Turkey

serkanaydin@techemail.com

***Abstract*- In this paper vocational training activities applied in the candidacy process of the Republic of Turkey which is a European Union candidate country, between the years 2000-2010 are explained. Reforming education and training systems is among top priorities of the Turkish government. Reform efforts have been supported by EU funded projects such as Support to Basic Education Program, Strengthening Vocational and Technical Education Project and Modernization of Vocational Education and Training Project. These projects supported for developing and implementing national lifelong learning policies aligned with Lisbon objectives and curriculum development in vocational and technical education. Turkey is a physical and cultural bridge between Europe and Asia. Turkey's largest city, Istanbul, which was the capital of the Byzantine and Ottoman Empires, has the most of the population and is the focusing point of the cultural connection in Eurasia. Approximately 17.8% of the entire population (12.915 million) live here. Due to this fact, all investigations and evaluations which were made in this area can be characterized as the heart of the country. In this paper comments in this study are transferred as a mix of the observations of technical teachers who are working in Istanbul, the brainstorms which were had together with their managers and group mates, the issues encountered, and the complaints which came to Istanbul from other regions. Vocational training activities which will be explained by interpreting from the perspective of Istanbul and the effects of these activities are expressed with the positive or negative ways and the indicators of the author.**

Keywords- Vocational Education; Vocational High Schools; Turkish National Education; EU Compliance

I. INTRODUCTION

There cannot be any other luxury for a country which likes training unskilled workers and brain power. Work power is the greatest capital of developing countries. To produce numerous products which have desired standards with qualified staff in a short period of time means power in the world market. 50% of the population of the Republic of Turkey, 72.5 million, are under the age of 28.8 [1]. Except the number of students studying at universities, the number of students studying in formal education is 16.137 million (69.5% of the population), the number of students studying at non-formal education is 7.062 million (30.5% of the population) and along with this, 33% of the entire population are under the age of 19. When statistics of Turkey, a candidate country for the European Union, are compared to statistics of Greece and Bulgaria, which are neighbours of Turkey and members of the European Union, it is seen that there are more students than the total population of these two countries who are studying under the auspices of Turkish Ministry of National Education. Populations in various countries are shown in Table 1 [3].

TABLE 1 POPULATION OF SOME COUNTRIES

Country	Population
Turkey	70.1 million
Bulgaria	7.6 million
Greece	11.6 million
Germany	81.7 million
France	65.4 million
European Union	494.8 million

Keywords of the first ideas which were put forward in order to create an association in 1951 in the European continent are steel and coal (EU, 2011). Entering the 2000s, "Vocational Training" has been added to these keywords targeting the year 2010 with Lisbon Council of March 2010, 2001 Stockholm European Union Council, 2002 Barcelona Council and Copenhagen Declaration. Vocational training is one of the most important parameters which show a country's level of development. Governments who are aware of this organize their development plans to make vocational training common and increase the quality of it, make decisions and operate the decisions taken.

As for the 2008-2009 academic years in Turkey, it has been analyzed that 58% of 96% of the students in primary education continued to secondary education and 27% of those students continued to higher education. During the 2009-2010 academic year, the number of students studying in vocational training institutions is 1,819,448. The number of students studying at universities is not included in this number. Between the academic years 2008-2010 in Turkey, an increase has been observed in the number of students studying in vocational training institutions when it is compared to the number of high school students studying in general education. In Figure 1, the number of students studying in vocational training and general education is

shown [2]. The increase occurring between 2008-2010 academic years is because of the fact that 3 years of education in high schools have been increased to 4 years. Implementation of the education period of 4 years, which was covering only the students studying at technical schools, has been valid for the ones studying in vocational training education and general education.

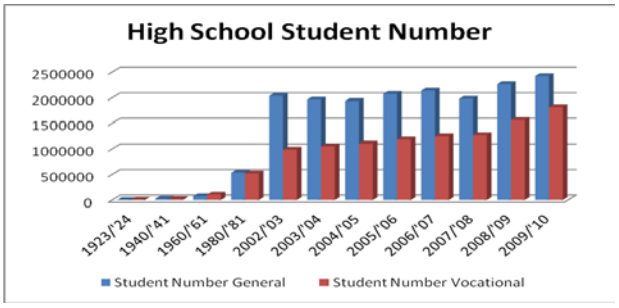

Fig. 1 Comparison of general and vocational education student number

In November 2002 Copenhagen Declaration of the European Union has decided to apply dynamic and technological education models in parallel to life-long learning and vocational training. In Europe, activities for the common transparent professional qualifications that can be achieved step by step have been made a priority.

In order to learn the experiences of other countries and to determine the common points and concerns, various studies were seen as a necessity by the governments of the European Union and funds were allocated for this work. After the year 2000 in Turkey, a number of European Union grant projects have been applied through these funds. In the process of harmonization with the European Union, serious reforms have been conducted in education programs along with the SVET project, which is related to vocational training. The SVET project was signed by the Turkish government and the European Union in July 20, 2000. In the SVET project, which has been prepared under the MEDA, Mediterranean Programme of the European Union, accordance with the demands and the participation of the private sector, a number of studies have been done in order to create an internationally recognized vocational system, which is within the scope of a national classification standard and based on the modular training system within the framework of compliance with the principles of life-long learning and Turkey's social and economic needs and the modernization of vocational education and training system. The project started in 2003, September 30. Diagram of this project is given in Figure 2 [4].

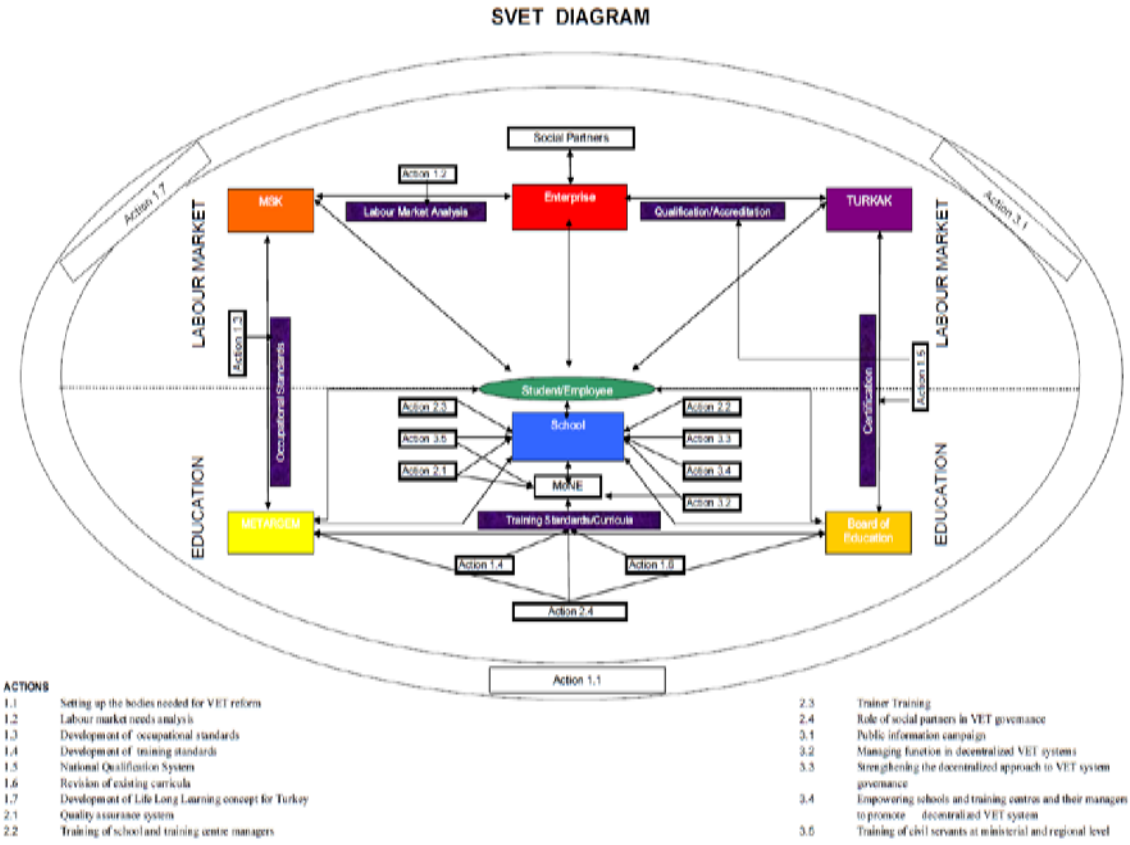

Fig. 2 SVET Project Organization Diagram

II. VOCATIONAL EDUCATION IN TURKEY

Education process in Turkey is divided into two as general education and vocational education. Figure 3 shows the Turkish National Education System which is reconfigured in the year 2007, after the decision foreseeing of 4 year education process for any program in secondary education. General education system aims to develop the academic selves of the ones who will be studying at universities.

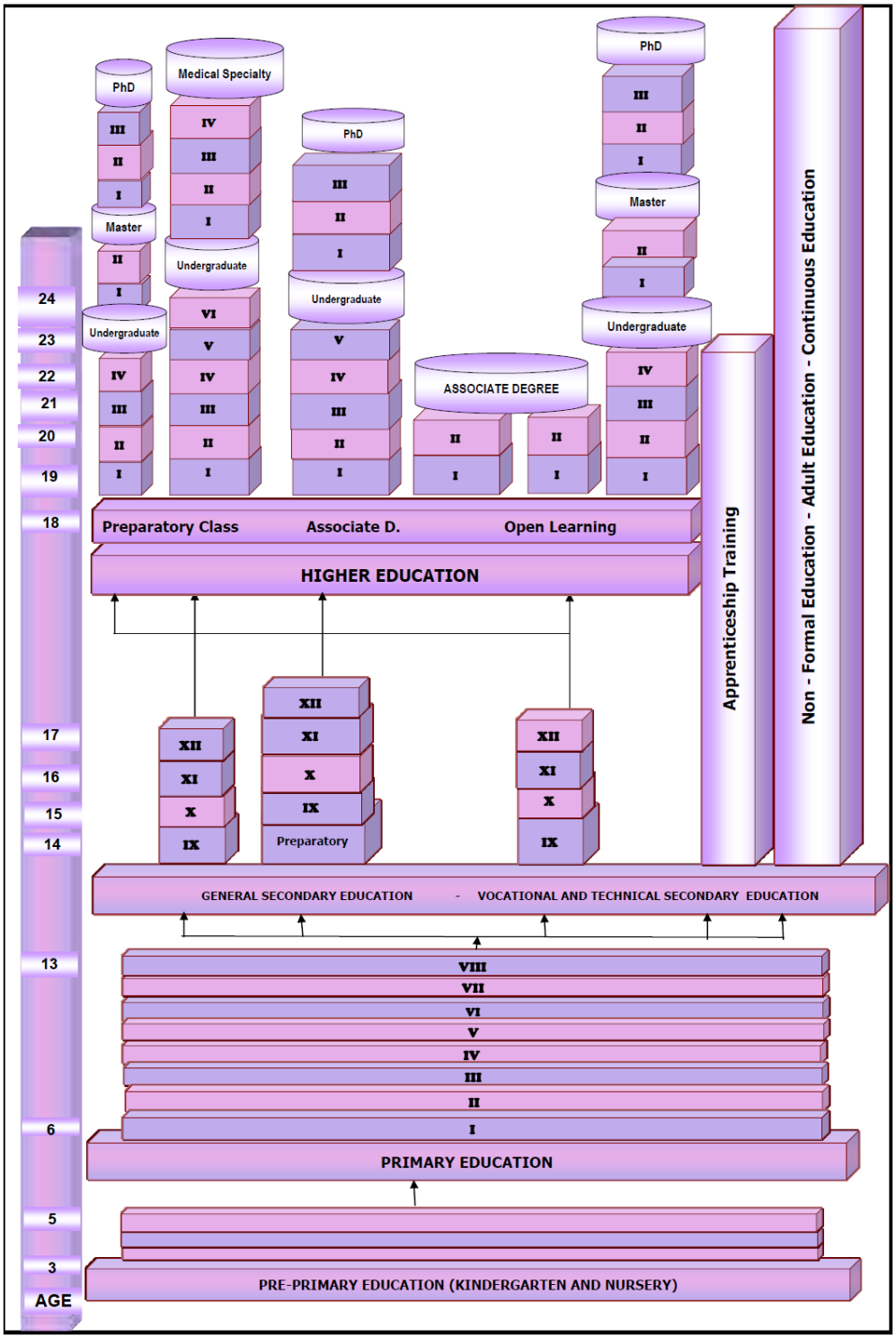

Fig. 3 Turkish National Education System

Vocational training in Turkey is applied as formal education, non-formal education and certificate programmes via distance learning or face to face instruction Non-formal vocational education is applied as modular for 4 profession levels respectively apprentice, headworker, master and master trainer, especially for the ones who do not have the right of formal education at technical education institutions. In addition to this, students are educated remotely or face-to-face at Open High Schools.

Students are responsible to study vocational courses with vocational teachers face-to-face in the evenings and at the weekends and to achieve general courses with central examination system.

In the year 2010, none of the professional qualifications has been given to those who are in general education system. Although accounting, home economics and courses like that were given as elective courses in the 90s, after reform of the 5-year compulsory education to 8 years, these courses are not taught any more.

Along with the implementation of the SVET project in 2003, education process at Industrial Vocational High Schools, which was 3 years, has been changed to 4 years education. After the 8-year compulsory education, "Introduction and Orientation", a 2-credit course, and "ICT", a 2-credit course, have been given in the first year of high school education according to the educational model which will be implemented as 9th, 10th, 11th and 12th. Class. For the students who will choose a professional field, these two courses will:

Provide the promotion and spreading of vocational education and the preference for the desired profession.

Provide a positive guidance for the preference of the professions which include extensive knowledge of information technologies.

Entering the year 2010, these two courses were removed from the curriculum of secondary education. What is taught in these courses has been transferred to the curriculum of primary education.

The SVET Project was implemented in 40 general high schools and 105 vocational training institutions as pilot in 2003. This training programme has been based on the modular training system. Because this system is based on the principle of being able to take more as long as having taken enough, "Grading System" has been applied in Turkey. This system gives students the opportunity to pass their classes if they have required GPA, even though there are some classes which they have failed. In this manner, students are able to take the higher proficiency of a vocational course which they failed. This is an allowance of the grading system. In Figure 4, the scheme of SVET model is given.

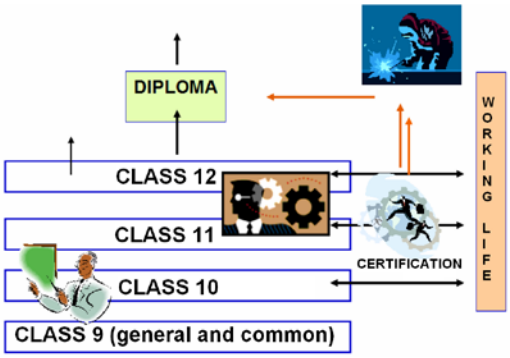

Fig. 4 SVET education model

Class 9 is common in both general education system and vocational training system. This system is thought to make transitions and transfer between the types of school easier. All students who complete the Class 9 successfully are able to pass the Class 10 of any type of school they want. For example, a general high school student may pass the department of child development, which is taught at girls' vocational schools. The opposite of this situation is possible, as well. This opportunity is provided by giving only general education courses in Class 9 instead of a curriculum which includes both general education and vocational training courses. As an exception, Religious Vocational High School students have difficulties in school transition due to the fact that the curriculum of these types of school includes vocational courses in Class 9. Vocational Training in Turkey:

General Manager of Technical Education for Boys (Modular Formal Education and Training)

General Manager of Technical Education for Girls (Modular Formal Education and Training)

General Manager of Trade and Tourism Education (Modular Formal Education and Training)

General Manager of Religious Education (Formal Education and Training)

General Manager of Apprenticeship and Non-formal Education (Common Modular Education and Training) is coordinated by 5 general managers. Although these managers have been named according to the education programmes they apply and the student groups who are appropriate for these programmes, for example the ones who are educated in the field of information technologies can also be educated at schools within the general managers of technical education for boys, technical education for girls and trade and tourism education. General Manager of Apprenticeship and Non-formal Education deals with groups of students outside the formal education and applies formal curriculums of all general managers as modular in non-formal education model. In Table 2, changing of course credits in Turkish vocational high schools in Turkey is shown.

TABLE 2 VOCATIONAL EDUCATION SCHOOL COURSE CREDIT CHANGES

	Before 2005							**After 2005 (Year 2010)**						
Industrial Vocational High School	3	9th 10th 11th	41 41 41	4 0 0	14+1 30 30*		*Last Year 3 days in a Week Between 18 and 25 credit course	4	9th 10th 11th 12th	3 20 0 0	30 35 40 40	0 16 22 28*	0 3 6 5	*Last Year 3 days in a Week 24credit Course
Technical High School	4	9th: From Vocational School					In summer 48 days	4	9th: Any General or Voc. School					In summer 48 days (300hours intern)
		10th 11th 12th	41 41 41	0 0 0	21 20 30	4 0 1			10th 11th 12th	0 0	43 45 45	15 17 20	12 0 0	
Anatolian Vocational High School	4	P*** 9th 10th 11th	 41 45 45	 6 4 4	 14 24 30*	 0 4 2	*Generally Last Year 3 days in a Week 19&24 credit course	4	9th 10th 11th 12th	6 4 4 4	33 40 45 45	0 16 22 28*	0 6 7 6	*Last Year 3 days in a Week 24credit course
Anatolian Technical High School	5	P*** 9th 10th 11th 12th	 41 45 45 45	 6 4 4 4	 14+1 27 20 30	 0 4 0 1	In summer 48 days	4	9th 10th 11th 12th	6 4 4 4	33 45 45 45	0 15 13 16	0 12 0 0	In summer 48 days or (300hours intern)
	Duration (year) Education Period (YEARs)-	Classes ***1 Year F.L Preparation 24 Credit F.L 4Credit Turkish Language	Total Credit	(F.L)Foreign Language Credit	Vocational Course Credit	Optional Credit**	Internship	Education Period (YEARs)	Classes There is No Preparation Class	(F.L)Foreign Language Credit There is No F.L. Preparation	Total Credit	Vocational Course Credit	Optional Credit**	Internship

One study related with the changing of course credit and curriculum development in Turkey [6] shows that 3 years traditional (VTE) vocational education program is harder than 4 years new modular education program. Because 14 credit vocational courses which are applied in first class (9th in 3 years VTE) decrease the cultural courses' successes rates and reduce the students' interest in cultural subjects. In addition to this study analysing the reason between traditional and modular education program, one important similarity is shown that technical lesson teachers do not behave as a guide to answer students' question or do not show additional effort to solve students' problems as cultural lesson teachers because both modular and traditional students' responses are described as "we are afraid to ask questions about issues that we cannot understand" in applied survey. In Table 3 statistical data is given for related study.

TABLE 3 SURVEY RESPONSE FOR 28TH ITEM

1:Modular 2:Traditional		Number of Student	Mean Degree	Total Degree	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2 tailed)
Asking question	2	75	88.15	6611.00	2839	6755.000	-2.317	0.020
	1	88	76.76	6755.00				

$p<0.05$

Additionally, Multi-Programmed High Schools, which give the courses of both general education and vocational training, have been founded in the regions with low population density after the year 2000 [5]. This can be defined as temporary solutions of the rapid reforms which were conducted after the year 2000. This type of high schools is teaching without discrimination between male and female students and giving courses such as health, sports, communication, hospitality and tourism. In these schools vocational and classical non-vocational high school education programs are applied.

Besides, after the year 2006, when the first step of the SVET project was applied to the programmes of general managers of technical education for boys, technical education for girls and trade and tourism education, vocational high schools under the control of the Ministry of Justice, Ministry of Agriculture and Forestry, Ministry of Health and Ministry of Public Works have been transferred to the Ministry of National Education. After this transfer, curriculums of these schools have been modernized according to the modular education system under the control of the General Manager of Technical Education for Boys. Schools which were put under the control of the Department of Health of the Ministry of National Education have been transferred to

foreign language schools that accept students after the examination. The reason why there is an exam requirement in Health Vocational Schools may be expressed as a solution to avoid congestion problem, which will be caused by the employment gap in Turkey in the field of health, during school registration.

Transitions to vocational high schools in Turkey take place as 4 different ways:

After primary education, placement in Vocational and Industrial Vocational High Schools based on diploma grade

Placement in Anatolian Vocational and Technical High Schools based on central examination grade

After completing the Class 9 education in any type of high school, placement in Vocational and Industrial Vocational High Schools based on the average grade of Class 10 diploma grade, Class 9 grade and advice guidance note

Placement in Technical High Schools based on the order depending on having at least 55/100 average grade of Class 9 courses: Expression Language, Mathematics, Physics and Chemistry

Although diploma grade has been emphasized in the first item, in the year 2007 the Ministry of National Education has requested for any student who registers to study at Vocational High Schools not to be rejected publishing the circular containing the information of transition of full-day education to morning-afternoon education. As a consequence of this situation, there has been an increase in the number of students who study at Vocational High Schools. When the increase resulted from having extended education period (from 3 years to 4 years) is added to the increase resulted from this situation, the need of increasing the number of vocational high schools and assigning new vocational teachers is born. If it is needed to put this state in numbers, a vocational high school with a capacity of 2100 students will graduate 2100/3=700 technicians per year under the most ideal conditions in 3-year education model. This number will be 2100/4=525 in 4-year education model. If this high school implements the morning-afternoon education model, this number will be 4200 maximum and so this school will be expected to graduate 4200/4=1050 technicians at the end of the academic year.

In the year 2008, morning-afternoon education system has been implemented in vocational high schools and this has put a strain upon the capacity of vocational high schools. As a result of this situation, the need of more teachers, more course equipments and materials has come in view. Because of this, in the year 2009 the Ministry of National Education has decided to close general secondary schools which accept students without examination gradually, and requested these schools to be converted to Anatolian High Schools which give academic education. Along with this decision, an additional capacity has been provided for vocational high schools and a strong basis has been provided in order to increase the number of graduate students after the year 2010. In Figure 5, the chart of the number of students who graduate from institutions of secondary education in Turkey has been given from year to year. It is seen in Figure 5 that extending education time from 3 years to 4 years has put its effect during 2007-2008 academic year [2].

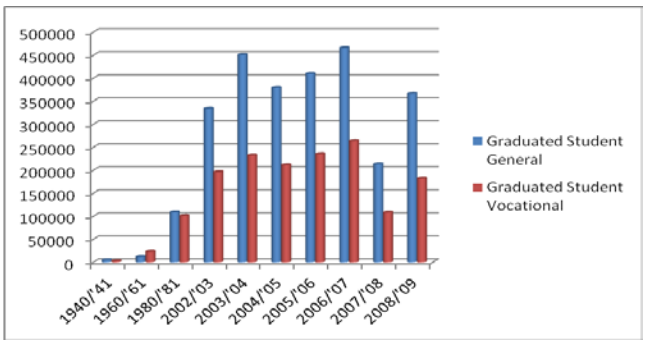

Fig. 5 Graduated students by years in Turkey

In accordance with the decisions made in Turkey prior to the year 2010, the number of students who study in the field of vocational education and graduate from vocational schools will be more than the number of students who study at general secondary education institutions. The reason of this situation is the fact that students who want to get an academic education at general high schools, in other words the ones who want to continue their educations at universities, will have entered general high schools with examination. These high schools have a certain number of quotas. Placement in secondary education in Turkey after the year 2010 will be done as in the Table 4.

TABLE 4 SCHOOL REGISTRATION TYPE

With Examination (Limited quota)	**Without Examination (For all primary school graduates)**
Science And Technology High Schools	Multi-Programmed High Schools (by demand)
Social Science High Schools	
Anatolian High Schools	General High School (by location)
Sports High Schools	
Fine Arts High Schools	
Anatolian Vocational and Anatolian Technical High Schools	Vocational and Industrial Vocational High Schools (by diploma grade or compatibility)

The fundamental basis of serious reforms conducted in Republic of Turkey in the process of harmonization with the European Union between the years 2000-2010 was the SVET Project. Right after this project, the SEP (Secondary Education Project) was realized with World Bank loan. Under the SEP Project, implementation studies of professions which had been included in the body of the Ministry of National Education after the SVET Project such as justice, agriculture, animal breeding, firefighting, railways, cadastral survey and meteorology to the modular system were conducted.

After the SVET Project and in the continuation of the SEP Project, the Ministry of National Education has created a module (course notes) bank [7]. In this bank, which has been created with e-book quality modules, which can be accessed via the Internet, there are 50 professions and the information which describes the adequacy of these professions.

III. EVALUATION AND RESULTS

In Turkey, vocational education wanted to be promoted by government. They also started to give grant for investors who built technical school in organized industrial zone. The grant is approximately 2000$ for each student. But the ratio of the number of students who study at private vocational high schools to the number of students who study at government vocational high schools in Turkey is 0,009%. Why the students register private industrial vocational school in organized industry is short count of this school. These schools are also located out of town. The number of full-scholarship students who are educated by the private industrial enterprises and the number of students who study at private tourism and hospitality vocational schools, which ensure to work, is 1601. The greatest reason why this number remained at these levels under the conditions of Turkey between the years 2000-2010 was losing the points of vocational high school graduates when they take the university entrance examination. For example, prior to the year 2010, when a student who graduated from vocational high school as an electronic technician wanted to be a telecommunications engineer, this student would lose a great deal of point. This student would get additional points as long as he chose to be a teacher in the relevant field. However, there would not be any changes in the score coefficients of general high school graduates if they wanted to be engineer. This was a system based on political reasons, which applied for many years in Turkey.

This problem has been solved partially by converting Technical Education Faculties to Technology Faculties. Exceptional quotas have been created for vocational high school graduates at Technology Faculties. It has been achieved for vocational high schools graduates to study in the field of engineering at these faculties by competing among themselves and being put in order according to scores they have done in the first part of 2-stage university entrance examination. It has been planned to remove the problem of shortage of technical teachers, which will occur because of closing Technical Education Faculties, by providing the opportunity for graduate engineers to take pedagogical formation participating in certificate programmes. In Figure 6a students/teacher ratios in primary education and in Figure 6b student/teachers ratios in upper secondary education (general education such as high school and vocational training) are shown for some countries [15] (TR refers to Turkey)

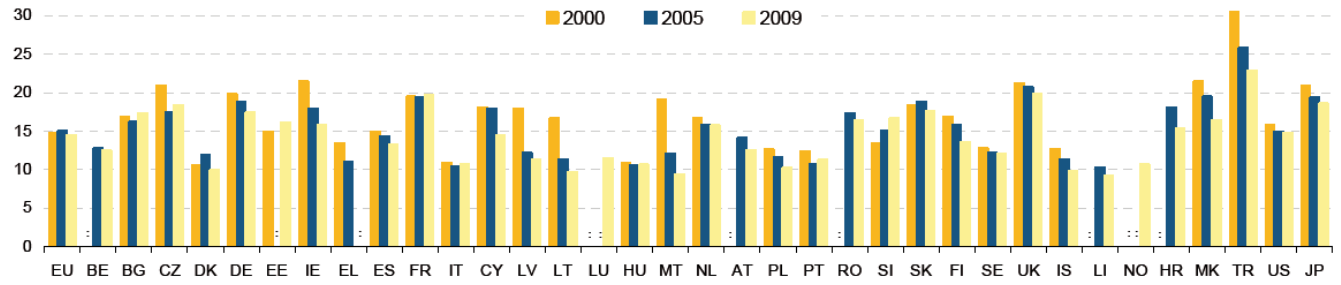

Fig. 6a Students/teacher ratios in primary education

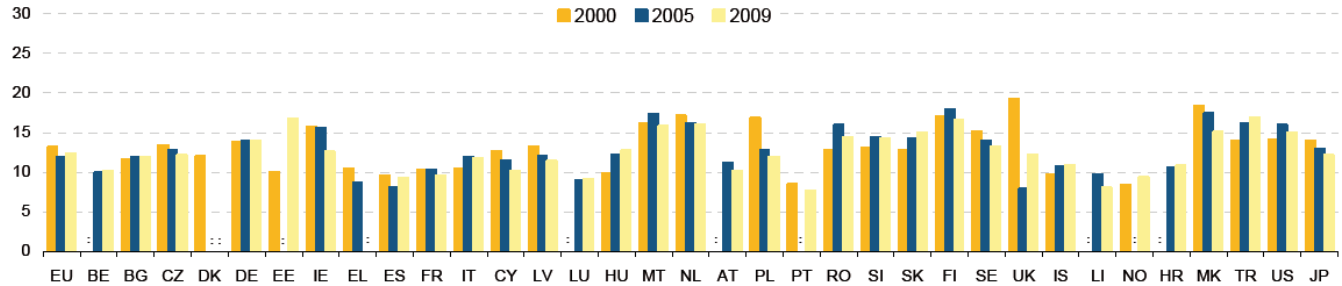

Fig. 6b Students/teacher ratios in upper secondary education

During the process of harmonization with the European Union in Turkey, a great number of social and cultural studies had been done on the area of vocational training to develop education and training programmes [16]. A large participation had been materialized in the lifelong learning programmes (Leonardo, Socrates, Comenious etc.) cross the country. The most important aspect of the structure and support provided by these projects was that it enabled them to work with people from other

countries. It allowed them to foster and develop their networks. This process was certainly a significant aspect of the European dimension. But participants also described the European dimension as better knowledge about and understanding of other systems, cultures, and countries, as well as greater awareness of diversity [8]. In addition to this, project works about the development of distance education with the countries bordering the Mediterranean Sea and supplying quality and quality assurance have been done [9]. As a result of these studies, degrees of awareness about computer-assisted course giving, using the distance learning environment and developing 21st century skills of teachers participating in the pilot project have been increased [11]. IT and ITC based competencies are key factors in efficient education system [10]. On the subject of developing 21st century skills, studies related to distributing tablet PCs to all students in Turkey and developing computer-assisted teaching materials are done [12]. As a result of this project, ICT competencies of student will be increased and students are thought to become more interested in the IT-related professions and equalizing education materials for each student will be done.

Afer the year 2000 in Turkey, the books of culture courses which are taught in government schools have started to be distributed free of charge. In the year 2011, books in the relevant field of profession which exist in the module bank are given freely to the ones who study at vocational high schools. Printing the vocational books, means to increase vocational training costs for the government. Considering the cost of printing books for a period of 5 years, it has been predicted that access to electronic textbooks using the tablet PCs would cost less.

In the year 2010, the development of new occupational areas and the development of educational programmes in the studies on developing programmes have been accelerated. Along with this, the books in the module bank have started to be given an overhaul. Since all these studies have been done in a very short period of time, it has a great deal of importance to examine the academic quality of this work.

In the early 2000s, students who study at vocational high schools got the right of passing to 2-year government universities without examination. Placements are made based on student achievment scores during the vocational training. In this context, universities located in regions close to each other in Turkey have been divided into groups as vocational-technical school districts. In the year 2011, students who have a high achievement score are able to take a higher education as a continuation of the profession in their own vocational training region. Under the circumstances of having a low achievement score, students from vocational high schools are able to continue their education in the regions far away from the metropolitan cities. Despite all of these, there might be quota spaces in the placements of the universites located in the regions with low income and private universities. This quota is inversely proportional to the occupancy rate of Turkey's economic situation.

As a consequence of the harmonization studies with the European Union, Vocational Qualifications Authority is founded in Turkey. For all professions, establishment and control of qualifications according to the environmental conditions and sector-specific needs will be done by this institution. Along with the establishment of this institution, the professions which have been created in the process of harmonization with the European Union have started to be analyzed again. Sector committees established under the Vocational Qualifications Authority have started to confirm professional standards from professional associations and federations. It is quite clear that this system will help education programmes remain fresh by the feedback to education and training programmes.

Another important issue in the field of vocational training is standardization of qualifications. Certification work, which shows vocational knowledge and qualifications, is well-known to have a great importance all around the world. To design and develop the best measurement and evaluation system and to use this system in the most efficient way is very important, as well. Grant project has been given by Vocational Qualifications Authority in order to develop the testing and certification studies related to this issue [13]. The central testing and certification system which will be formed in this context will be an example of a reliable system which will measure qualifications and determine the levels and will lead to the next studies.

The organizational structure of the Turkish Ministry of National Education was changed in 2011. In the current organization, General Manegement of Technical Education for Girls Technical Education, General Management of Technical Education for Boys, General Management of Trade and Tourism, Apprenticeship, Vocational and Technical Education Department of Development and Dissemination and Department of Healt works are grouped under one general management and took the name of General Management of Vocational and Technical Education. This situation will avoid giving the same programme in different ways. Furthermore, it is thought that this situation will coordinate opening and closing the professions and their brances which are taught at schools based on the sectorel and regional differences in a more efficient way. Along with the change which is made in the organizational structure, General Management of Lifelong Learning has been formed. The duty of this directorate has been defined as maintaining common and open education and training services. The process of harmonization with the European Union has put an impact of the new organizational structure and General Management of the European Union and the External Relations has been formed by linking two general directorates and one presidential [14].

When studies related to vocational training in Turkey are examined, the following issues are remarkable:

New academic programmes and professional modules could have been better.

National strategy plans are not made very carefully.

Continuity and stability were ignored in education system.

Education and training system is influenced by political decisions.

The success of the students and attendance in school gets worse than ever before.

Technicians' foreign language skills are decreased.

As a result of the rapid developments related to education and training in the last decade in Turkey, negative circumstances could be expected to occur. Looking at the human and social behavior in the developing and developed economies, social and cultural distortions have been observed to increase rather than before. It is a normal situation for students to be influenced and focused on the environmental factors which grab their interest. It is an important consideration for each country to review their own education and training programmes according to changing environmental conditions and technological developments. Education and training activities free from political interests put their benefits and losses forth after a long period of time. Education system in Turkey, a country that serves as a bridge between Asian and European continents, is a system in which societies in the synthesis of the eastern and western cultures are trained together. For this reason, the studies that have been done during Turkey's EU candidacy process are important to be reviewed.

REFERENCES

[1] TUIK Statics 2009, Turkish Address Based Census Registration System Result 2009 News, Bulletin. http://www.tuik.gov.tr/PreHaberBultenleri.do?id=6178

[2] MEB Statics 2010, National Education Statics Formal Education 2010-2011 Book, http://sgb.meb.gov.tr/istatistik/index.htm

[3] Demographics of Europe 2010. http://en.wikipedia.org/wiki/Demographics_of_Europe EU 2010. http://en.wikipedia.org/wiki/European_Union

[4] SVET Diagram, http://svet.meb.gov.tr/indexen.html, 2010.

[5] MEB Magazine, Milli Eğitim Bakanlığı Çok Programlı Liseler Yönetmeliği, http://mevzuat.meb.gov.tr/html/3052_0.html, 2001.

[6] S. Aydin, and M. Meral, In SVET/MEGEP (Strengthening The Vocational Education And Training System Project) Range Success Of Electric – Electronics Area Modular Education Class Students, 1st International Vocational and Technical Education Technologies Congress, Istanbul, Turkey, 2005.

[7] VET Modules, http://translate.google.com/translate?hl=tr& sl=tr&tl=en&u=http%3A%2F%2Fmegep.meb.gov.tr%2F%3Fpage%3Dmoduller&sandbox=1, 2013.

[8] J. Gordon, "The Internationalisation of Education - Schools in Europe and the SOCRATES Programme," European Journal of Education, vol. 36, iss. 4, 2001.

[9] J-R Masson, M. Baati and E. Seyfried, "Quality and Quality Assurance in Vocational Education and Training in the Mediterranean Countries: lessons from the European approach," European Journal of Education, vol. 45, iss. 3, Part II, 2010.

[10] D. Pepper, "Assessing Key Competences across the Curriculum and Europe," European Journal of Education, vol. 46, iss. 3, 2011.

[11] http://www.etf.europa.eu/web.nsf/pages/Turkey, 2013.

[12] http://fatihprojesi.meb.gov.tr/tr/english.php, 2013.

[13] http://www.voctest.org/, 2013.

[14] http://mevzuat.meb.gov.tr/html/28054_652.html, 2013.

[15] Eurostat Statics, 2011.

[16] http://www.ua.gov.tr/en/home, 2013.

Serkan Aydin received his B.Sc., M.Sc. and P.hD degrees in Electronics and Computer Education from Marmara University Technical Education Faculty and the Institute for Graduate Studies in Pure and Applied Sciences. He is an electrics and electronics chief teacher at IMMIB Erkan Avci Industrial Technical Vocational High School and He is instructor at Marmara University Vocational School of Technical Sciences. His research interests are vocational education, electronics, telecommunication and GNSS (Global Navigation Satellite Systems).

View publication stats