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Transformation of technical education faculties in Turkey in the process of European Union: Faculty of applied sciences

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Abstract

Countries education systems unavoidably changes to adapt themselves to innovations because of developing technology and globalization. This perspective technical education faculty position is queried which are established with the aim of educate technical teachers for vocational high schools in Turkey. “Faculty of applied sciences” model can replace with the technical education faculty that has completed its mission. It is possible to educate engineers with the faculty of applied sciences who has qualified, keep up the technology and has the characteristics necessary for the working life.

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1. Introduction

Three important elements needed by industry can be listed as, raw materials, manpower and machine power. Industry is the driving force for the countries economy which is following to the technological developments to compete world markets. Manpower must be well trained to achieve success for the production processes. At the industry success can not be right if engineer’s, technicians and workers doesn’t have harmonization and joint training strategy.

When we examine the economic structure of European Union countries, it is important to produce more value-added technology based on high-quality goods and services besides the agricultural products. This can only possible to train qualified vocational and technical staff. However, it is inevitable necessity that changed to vocational and technical education organizations.

With other countries to compete, to protect our country's manpower value among the EU countries of goods and services movement, in the economic field to increase production, only the purchasing and using country to become, in the labor market supply-demand balance of the conscious life-long learning principles provide the opportunity a vocational and technical education system is essential to develop a transformation.

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Examination of the educational systems of developed countries can respond to these needs of the schools training people already in Germany, Austria, Liechtenstein and Switzerland in countries such as providing education of the Faculty of Applied Sciences (Fachhochschule) is deemed to be. Faculty of Applied Sciences (UAS) specializing in some specific areas (such as technology or business) located in the Bologna process, and undergraduate and graduate degrees are higher education institutions can provide.

Graduates of technical education faculties in Turkey have had the title of “Technical Teachers”. They employed with this title as a teacher at national education ministry or education department of private companies Due to problems with authority, however, they do not have equal rights with engineers for the study areas remains limited. Today, in this respect graduated people from the technical education faculties are having trouble finding a job (Tunçalp, 2005)

2. Vocational Technical Education in Turkey

Vocational education is given in formal and mass education institutions in Turkey. Formal vocational and technical educations for high schools are organized in two main categories: vocational school and technical high school. All fields of vocational high school that is open to everyone who has completed basic education. Technical high schools are accepted students who successfully completed the first year of vocational high school. Anatolian Vocational High School in the 1-year preparatory classes are taught foreign languages, it is followed by a three-year vocational education. Technical High Schools are given education along with vocational training curriculum, a similar education general high school science field. Therefore, students of this school could have higher chance for university education (Şahin et al., 2008, Sağlam et al., 2003).

2.1. Vocational and technical high schools

The main purpose of vocational and technical high schools is to meet the industry, commerce and service sectors needs of qualified workforce and provide successful transition of students for university. These schools provide training in 60 different types and numbers are reached to 4000. (Şimşek, 2007, Şahin et al., 2008).

2.2. Vocational university education

Vocational technical education is conducted through two-year in vocational high schools and four-year technical education faculty. Two-year vocational high schools are founded to meet technician need of industry requirements. Technical education faculties which are given four years education, main objective is to meet the needs of the teachers for vocational high schools. Technical education faculty graduates have turned to industry because they didn't appointed as a teacher in recent years (Şahin et al., 2008).

2.2.1. Vocational high school

Vocational high schools are one of the most important stages "Vocational and Technical Education System". Vocational high schools are established to train technicians for Industry, trade and services sectors. Vocational high schools are aimed to fulfill the field between technical education faculties and technical high schools. (Şahin et al., 2008).

2.2.2. Vocational and technical education faculty

Technical education faculties which are given four years education, main objective is to meet the needs of the teachers for vocational high schools.

As of year 2008 there are 19 technical education, 2 vocational education, 1 commerce and tourism education and 1 industrial arts education faculty in Turkey. These schools have 38,272 students at 2007 education year. (Şahin et al., 2008).

General programs and technical programs in Turkey in terms of number of students is made comparisons to other countries that are seen by very low percentage (Table 1.) For example in England this ratio is %30.8 / % 69.2 againsts in Turkey %63.3 / % 36.7. This ratios are shows the opposite situation.

Table 1. General and vocational-technical programs of some countries, enrollment rates (Şahin et al., 2008)

Countries	General programs (%)	Vocational and technical programs (%)
Poland	45.7	54.3
France	43.6	56.4
Germany	37.8	62.2
Netherlands	30.9	69.1
Swiss	35	65
Belgium	29.71	70.3
Finland	41.2	58.8
Austria	20.7	71.8
Czech Republic	20.5	79.3
England	30.8	69.2
Norway	40.8	59.2
Denmark	46.4	53.3
Uruguay	81.3	18.7
Chili	63.1	36.9
Indonesia	64.7	35.3
Countries average (world)	51.2	50.2
Turkey	63.3	36.7

However, cause of the re-configuration of Vocational Technical Education is considered the model; decision of the council of ministers on 02.11.2009 is published at 13.11.2009 Friday in official gazette no. 27405. According to this decision technology faculties have been established by closing the place of technical education faculties. Higher education committee (YOK) is authorized to determine these new faculties the application based on the functioning.

3. Faculty of Applied Sciences in the World

Applied Engineering is defined by The Association of Technology, Management, and Applied Engineering as the field concerned with the application of management, design, and technical skills for the design and integration of systems, the execution of new product designs, the improvement of manufacturing processes, and the management and direction of physical and/or technical functions of a firm or organization. Applied Engineering programs typically include instruction in basic engineering principles, project management, industrial processes, production and operations management, systems integration and control, quality control, and statistics.

Applied engineers are employed in a large and wide-array of industries including: manufacturing, construction, industrial, maintenance, and even management. It is common for industry to use the term "engineer" in their title, except in regions that restrict this. Examples of this use include: Manufacturing Engineers, Process Engineers, Control Engineers, Applications Engineers, Product Engineers, Sales Engineers, Safety Engineers, etc. However, in some regions no one is legally permitted to offer engineering services to the public without becoming a licensed Professional Engineer (ATMAE).

4. Faculty of Applied Sciences Model for Turkey

According the report about Turkey's European Union accession process made in the year 2003 that was detected the presence of two basic problems in high school education. First of all the demand for high school education then the engineering faculty is very high and directed student's number is insufficient to the technical schools. University entrance exams lead to a distinction in favor of those who graduate from general programs.

Yet, according to these reports plans are implemented in Turkey that put forward the technical education since the 1970s. Many legislative measures have been taken including the rights for the entrance without exams to the

vocaitonal high schools to strengthen the position of them. But these precautions didn't reverse the trend normal high schools (2003 EU Progress Report).

Faculty of Applied Science is established to replace with technical education faculty at the proposed model and the graduates as their title "Technology Engineer". For example students who graduate from electrical technology department have “electrical technology engineer” title. Graduates will have better skills of application then to be better will be achieved. The curriculum in practice and laboratory work will be given greater weight than the faculty of engineering so the gradutes has better practise skills. (Figure 1.)

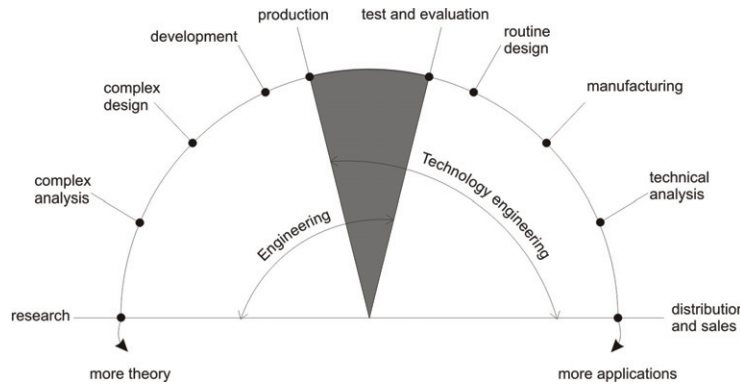


Figure 1. Comparison of engineering and engineering technology

The difference between these two engineering education summarizing in a table, (Table 2.) the most important difference that the first one has better knowledge-theory and design based skills and the other application based provides (Eltez et al.).

Tabel 2. Educaitional differences between engineering faculty and applied science faculty (Eltez et al.)

Engineering Faculty	Applied Science Faculty
<ul style="list-style-type: none"> ▪ Information and theory ▪ Engineering for new product design ▪ Mathematical models, theory and IT ▪ System orientation ▪ Research and development ▪ Vision development for the future with medium and long-term perspective ▪ Team ad source method 	<ul style="list-style-type: none"> ▪ Skills and practise ▪ Application engineering ▪ Applied mathematics and application of science ▪ Detailed application of Date information ▪ Product quality creation and service ▪ Develop a short-and medium-term perspective to realize their business objectives ▪ Team ad source method

Already in the business world needs engineers trained graduates of the Faculty of Engineering and Applied Sciences Bachelor's degree in engineering technology will be differences between the employment position. These differences will results of their training in the areas of technology expertise more highly skilled engineers and application specific information. Training phase than in the engineering disciplines, which will pass through an expensive training process technology engineers as required in business life of no benefit will result in a serious waste of resources.

As a results of the developments on working life; the concept of engineering in developed countries goes beyond the traditional sense and therefore the traditional engineering (Engineering) and application oriented engineering (Engineering Technology) as a separate type two engineering has emerged. The both areas of engineering work are complementary each other.

Table 3. The differences between graduates from the engineering programs and the technology engineering programs (Eltez et al.).

Job Opportunities	Engineering Program	Technology Engineering Program
<i>Typical first job position</i>	Engineering graduate. conceptual design in	Engineering Technology graduate. is

	industry, systems engineering, manufacturing and manufacturing-related research and development work in process.	responsible for manufacturing and technical operations, product development, testing, technical operations, service and work as staff responsible for Quality Check.
<i>Technical interest</i>	Engineering graduates more general, comprehensive technical solutions to problems for the analytical approach produces.	Engineering Technology graduates in a specific area and become experts on specific technical problems for application oriented solutions produces.
<i>Positions</i>	Engineers are often involved in administration positions.	Technology engineers positions are related to industrial management.

5. Conclusion and Recommendation

Trained workforce has gained internationally strategic importance. In this respect manpower whom can adapt to changes, the search for new markets and technologies that can renew itself and the application of qualified manpower training methods and programs from developed countries that should be taken into consideration. However, the power of industry to employ qualified people with this development and globalizing world, it would be possible to compete with its rivals.

The proposed model is established in the Faculty of Applied Science, professional fields should be determined in accordance with regional and sectoral needs. In this framework, together with emerging technologies to the study of emerging profession should be made.

The Faculty of Applied Science graduates in the fields of technology as an engineer in the industry itself as they can be employed, if they wish to receive pedagogical training in Industrial Vocational and Technical High School "Technical Teacher" appointed. On the other hand, both the Faculty of Applied Sciences needed by the upbringing of academics to provide opportunities, both graduates of professional career opportunities in the area to ensure the Faculty of Applied Sciences within their own masters and doctoral education should be given more rights.

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