

Education and Training in Surveying Sector of Turkey: Current Challenges and Future Perspectives

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SUMMARY

Before the global economic crisis, the surveying sector in Turkey was in a considerably good position. Some developing fields like immovable property valuation and GIS applications, rapid growth in construction sector, a parallel growth in surveying sector as a result of new cadastral tenders undertaken by private sector companies were the main reasons for this considerably better situation in surveying sector. Under these circumstances, there was a demand for surveying professionals at all levels in the sector. However following the global economic crisis the surveying sector has shrank largely like construction sector that employs a large number of surveying professionals. Now there are strong signals of unemployment risk in the sector. Considering this risk the education and training platforms in the sector as listed below should be analysed in a wide spectrum.

- Surveying programs in Technical High Schools
- Surveying programs in Vocational High Schools of the Universities
- Geomatics Engineering Departments of the Universities
- Master and Doctorate programs of the Universities
- Post-education Training and Orientation Courses of the Public Institutions
- Training programs of surveying sector
- Certification programs

In fact there is no strategic planning in surveying sector of Turkey. This is valid for education and training policies too. As a result of the educational policies of the central government, the number of students enrolling the geomatics engineering programs is increasing fast. For example while there were about 650 students enrolling these programs in 2004 the number has reached 1175 in 2009. This process that will certainly deepen the unemployment risk cannot be acceptable. Therefore, considering such developments, education and training in surveying sector of Turkey should be restructured in a new approach taking into account the lecture programs, academic staff, educational infrastructure, relations of educational institutions with surveying sector etc.

In this study a general overview of Turkish national professional education system of surveying is drawn regarding detailed investigation from high school level to postgraduate education level. The strengths and weaknesses of the education in all levels and their links are investigated. Hence problems discovered are underlined. Finally recommended solutions for more effective and beneficial education system for surveying is emphasised.

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1. INTRODUCTION

The first step of learning is practical life information and learning talk that is started to be learned at house, street and around family. Pre-school education and formal education that starts with primary education are the starting point of further steps. High school and university educations come later. Higher education is different than others in this education process. Only some of them who come from primary school stage have a possibility or chance to continue with higher education. This situation is not only means a privilege but also gives important responsibilities to persons. The persons who will receive higher education become candidate to “qualified man power” statute who will shoulder bigger responsibilities in society. Whenever there were deficiencies for obtaining information since primary education he has a chance to make up such deficiencies in further steps. However it is harder to make up such information deficiencies that still continues in high school-university stage. Vocational trainings that will be prepared after graduation play important roles for making up such deficiencies.

In addition to these explanations under education title, it will be meaningful to mention about the evolution of education in Turkey. Education system in Turkey had important changes from 1923 when the Republic was founded until today. But there were an important change in education area and especially in university education especially after the fascist military coup that was made on 12 September 1980. The main result of this change is widening of private education institutions in all stages of education and education became a paid education which was a public service before. 12 September Coup was made for making neo-liberal policies to be implemented in an easy way by using force and education area was left free to be determined by the market. And among another important subjects of the same period were giving up from planning in national scale and thought of development in all areas. The complexity in education system still exists today and continues to effect all occupation areas including surveying sector (Özlüdemir, 2010).

The subject of this paper consists of conditions, problems and solution suggestions for education in surveying sector of Turkey.

2. TECHNICIAN EDUCATION IN SECONDARY EDUCATION

General Directorate of Turkish Employment Organization (İŞKUR) describes Surveying-Cadastre Technician as “he is the only person who draws a piece of land in a certain rate on a scaled paper by using special marks and by taking its geographical structure, zoning status, settlement and public works status into consideration under supervision of geomatics engineer or technician”. According to İŞKUR, Surveying-Cadastre Technician carries out following specified businesses pursuant to general working principle of the business, using equipments and fittings in an effective way and in accordance with workers’ health, work safety and

environmental protection regulations and efficiency and quality requirements of occupation (IŞKUR, 2010);

- Carry out necessary measurements in the land of which is map will be drawn and cadastre will be made, and determine required information and numeric data,
- Help geomatics engineer and technician for drawing of land maps by computer and drawing instruments,
- Conduct outline drawing of zoning, settlement and public works status of cities,
- Conduct demanded corrections and colouring on maps
- Examine current map, plan, title deeds and similar papers and fulfil similar duties and operations.

Technician education is given in 43 “Surveying and Cadastre” departments in technical high schools, industrial vocational high schools and multi-program high schools which are connected with Ministry of Public Education. Besides, there is also one surveying-cadastre technician program in Vocational and Technical Education Centre (ETÖGM, 2010).

Period of study in these schools is 4 years after compulsory primary education. Besides giving students an adequate general culture and a civil world view in secondary education level during education process, it is also aimed to give an occupational formation that is required by the related industry and work area so that making students ready for working areas and higher education.

Students who graduate from all these schools enter into Surveying, Surveying and Cadastre, Mine Surveying, Title and Cadastre Vocational High Schools without examination in case they demand.

Occupational and technical education problems have been discussed in Turkey since 1963 when planned development period started. For example, predicted numeric targets were not reached. Content of programs were always criticised in terms of appropriateness with renovations and adequacy of given occupation. Practical information deficiency of education staff and also adequacy of equipments in schools are among criticisms. Actually students must be educated as being persons who can produce service in occupational areas even they are students. Thus, job of students who have preliminary preparation will be ready after graduation. Practical information of students are inadequate and they are brought into a situation like theoretical information piles are the main problems under this point of view.

These problems directly affect the students. An investigation shows that half of vocational high school students “would not study in these schools if they had change again” (Köktürk, 2005). This result is the indicator of a motivational situation of students.

3. TECHNICIAN EDUCATION IN VOCATIONAL HIGH SCHOOLS

Technician education in Turkey started in 1953 as planned and regular way. 3700 students were studying in technician schools in 1962 in Turkey as being 22 were evening and 4 were day education. Technician education was ended in 1967 and professional technician education was ended in 1972 due to various reasons. 45 “high schools” opened in 1975 connected with

YAY-KUR and numbers of technician schools were reached to 59 as being 45 of them “vocational high school” in 1979. “Vocational high schools” were connected with universities in 1982 by registering them under 2547 numbered Higher Education Law. Occupational and Technical Higher Education System significantly developed both for school and student numbers in time. In these schools education is made under technical programs, economics and administrative programs, health programs and nautical programs. “Technician” title is given to students who graduate from technical programs of vocational high school and “member of profession” title is given to students who graduate from social programs.

Surveying-Cadastre Technician program also exists among vocational high school programs in Turkey. According to İŞKUR, Surveying-Cadastre Technician is the person who “prepares substructure of projects such as cadastral map, barrage, road, watering, power line, urban and rural area and works among geomatics engineers with surveying-cadastre technician for making ready and zone maps” (İŞKUR, 2010). Totally 3518 students started education in 72 Surveying-Cadastre Technician program in 2009-2010 education period in Turkey. Besides numbers of Real Estate Management programs that are an important subfield of geometric sector became 41 in 2009-2010 education period and number of students who started studying in these programs became 1249 (ÖSYM, 2010).

It is expected for vocational and technical education system in Turkey to perform its duties more efficiently and effectively in relation to increasing international competitive power and increasing economical development by educating qualified human power that is required by industry and service sectors. However it is a known fact that vocational and technical education in Turkey is not in adequate levels both for quantity and quality. It will be the only way to increase competitive power of Turkey’s economy with developed vocational high schools and qualified technicians who are educated from these schools. According to investigations it was revealed that it is necessary to educate three fourths of work force requirement of business world by education of foundation degree level in 2000’s. But %7 of work force in our country is not literate. %70 of them have graduated from primary school/primary education, %15 of from secondary school and %8 of them from higher education. It is not possible to compete in international arena with such a low education level (Köktürk et al., 2005).

Evaluations of public opinion in relation technician education are as follows (Köktürk et al., 2005):

- “Vocational High Schools Program Development Project” that is started to be applied in all vocational high schools in 2002-2003 education period is an important attempt for uniformity. As the project was put into practice without making adequate preparation, and as the content of program was not evaluated except main courses, Vocational High School instructors have hesitancy and disagreement to put the project into practice, thus these are the important subjects to be thought.
- These precautions were taken to increase schooling rate: New Vocational High Schools opened and new high school quotas were created by benefiting from physical facilities of developed vocational high schools after course hours of these schools by using these facilities. Quotas of evening education were increased, it is allowed for

foundations to establish Vocational High Schools, was concentrated on distance education and internet based education is started.

- Vocational and technical education could not come into place that they deserve by status.
- In most of Vocational High Schools it is seen that laboratories, instructors and other substructures are not appropriate with the developed education program.
- There are some deficiencies in certain buildings belongs to vocational high schools. But continuation of education in buildings which are designs were completed is very important within respect of education quality for these schools which based on practice.
- While laboratories and workshops of these schools must be equipped according to technology that is applied by the industry in order to provide an education that is appropriate with the standards required by the industry, it is known that these equipments which have high costs are inadequate in vocational high schools of which are numbers are continuously increasing.
- Important part of current instructors did not have pedagogy education.
- Most of vocational high schools that are opened in recent years do not have adequate teaching staff.
- It is understood that students are given common courses in all programs for improving themselves also in communication, sciences, and management, culture-art and sports areas except vocational information of the students.
- Today there are serious differences in the system between the competence acquired in vocational high schools and the requirements of business circles. Certain part of education programs bent to narrow professions.
- Graduates who are educated in narrow skill areas could not apply these acquired skills to secondary areas thus this makes difficult for graduates to enter into business life.
- Establishing job trainings of vocational high schools to a legal ground have not been realized yet though various attempts.
- Quality and assurance has not made inseparable part of vocational and technical education yet.
- School-industry cooperation was not able to be brought into demanded level though certain conducted attempts.
- Two days of week are made class to students in trade schools and students are sent to practice three days. Thus, knowledge of students in main classes such as mathematics, Turkish and sciences are very low.
- Known problems continue for employment of graduates in their own fields. It can not be said that Vocational High School graduates are able to find adequate employment in industry.

Other subject is the vocation description in social perception. Surveying sector is developing and while developing it is working with other disciplines of which numbers are increasing and its application areas are widening in this period. Description of technician by Employment Agency is a great indicator for showing that this development was not understood.

4. GEOMATICS ENGINEERING EDUCATION IN UNIVERSITIES

In Turkey where planning is left, it is understood that programs which gives geometry education was also effected from this process. A great number of new departments were opened recently by ignoring requirements of the country and surveying sector, and quotas of geomatics engineering departments were significantly increased. For example, in 2004 approximately 650 students were studying in 8 programs (Köktürk et al., 2005) while this number increased to 1175 in 11 programs in 2009 (Öcalan, 2010; ÖSYM, 2010). This fact strengthens increase of unemployment risk in surveying sector that was affected from shrinkage caused by economical crisis.

The universities in Turkey tend to an education style that does not correspond with country requirements and was not planned according to these requirements instead of developing under global concepts, developments and approaches and they also tend to usage of imported technology instead of developing science and technology. This makes universities to become like a school and makes instructors to become like a teachers whose investigation abilities are weakened. Thus, international studies became more effective for instructors in universities to acquire title in relation to this subject. In today's universities, the studies that are published in international journals are accepted as important studies. This decreases attentions of universities and instructors to the problems at national level. However instructors must make efforts and have an environment where they reproduce and continuously renew themselves (Köktürk et al., 2005).

Quality, national and international accreditation concepts gained importance recently in Turkey in geomatics engineering education. Important steps were taken in relation to this subject for determination of national accreditation principles and criteria, and measurement of education qualities of available departments and to determine and remove their deficiencies (Çelik et al., 2006). Despite of all these developments, it is a fact that newly opened departments have problems both for inadequate instructors and infrastructure (Kılıç, 2003).

In European countries basic sciences are lower in schedules in comparison to Turkey. This shows that courses of basic sciences are completed in secondary school stage in European countries whereas this deficiency that is in secondary school is tried to be completed in higher education stage in Turkey.

Knowledge of upper level of foreign language became one of sine quo non conditions for today's engineer by today in order to follow technological developments and publishing in foreign language. Giving an occupation education except mother tongue is a completely different subject. Adequacy of knowledge of foreign language for occupational education for students and instructors are discussed. Thus, many academic members and students have problems for education in foreign language in universities of Turkey. Besides, perception ability for a person in mother tongue and foreign language can not be compared anyway (HKMO İST, 2002).

The ability of presenting a product that is created by an engineer as orally is an important subject. Recently, numbers of courses with social consent were increased in instructional

plans of geomatics engineering departments in Turkey, that increase abilities of students for expressing themselves and establishing oral communication.

Vocational classes are generally determined by Departments in universities. It is not possible to say that country requirements are adequately taken into consideration in this determination. It is seen that academic programs are prepared according to interests of instructors who are available in departments.

Recently, attempts for creating a program based on accreditation basis in certain universities take attention (Tunalioğlu and Öcalan, 2009). However it must be stated that there is not a tendency in universities for creating a program based on specialization and accordingly differentiation. Becoming the same in programs is among the weakest link of education in surveying sector of Turkey.

5. VOCATIONAL TRAINING IN SURVEYING SECTOR

Congresses, symposiums and panels organised by Chamber of Surveying and Cadastre Engineers can be evaluated among the scope of vocational training in surveying sector in Turkey. If this evaluation is accepted then programming of such activities will gain importance and it will be necessary for these activities to be designed as forming the wholeness.

Important part of public institutions in Turkey applies their own vocational training programs. However a constriction and “abandonment” was applied in all institutions especially after 1990’s about these educations. This caused problems in increasing qualifications of our colleagues and these processes still go on.

Universities play an important role in occupational training according to public institution and private sectors. But non-existence of continuous and systematic relations between universities and these institutions cause to prevent establishing proper instructional programs. Universities must fulfil its duty for supporting the sector and institutions in a more effective way.

Systematic seminars must be given in relation to this subject by instructors who are specialized and conducting investigations on the subjects related to the activity areas of all institutions. While this is a necessary action to be taken, certain public institutions reflect discriminatory actions in their relations with universities (HKMO İST, 2002).

These problems are also valid for private sector institutions as much as it is in public institutions. Private sector also needs to renew itself parallel to the developments in information, technology and other processes. Thus, professional skills of our colleagues who are both in public institutions and organizations and also in private sector must be improved by training them systematically. Persons who have manager status must also be subjected to trainings that increase their information and abilities and to provide them gain professional horizon for being able to solve the problems of the unit that they are responsible for (Köktürk et al., 2010).

6. CONCLUSIONS

According to evaluations the main problems in surveying sector in Turkey can be listed as follows:

- Coordination deficiency
- Cooperation deficiency
- Infrastructure deficiency on strategic and integrated thinking subjects
- Conservatism on renewal and innovation subjects
- Ineffectiveness on problem solving and accordingly project based thinking
- Inadequacy of participative processes

The solutions that will be produced for these problems will remove the disorganization and aimlessness that attracts attention in education field just like in other fields in the sector. Setting goals as “goals of engineering departments” are not efficient. These must be set as sector and country goals.

It will be important step for Geomatics Engineering Departments in universities to be in communication and interaction between each other and to provide communication and coordination between vocational high schools. It is necessary to start an integrated education campaign by adding secondary education institutions to this coordination network, where technical education is given.

As it is known that yields of investments in education subject will not be achieved in short term, a necessity for establishing a strategy in the steps to be taken has occurred. Focus on next 15-20 years of period and tending for establishing education infrastructure of future that bases on modern values of future must be starting point for this subject.

Human is the most important element in addition to programs, specialization and technological infrastructures in this process. It gains a special importance for human resources who prefer to work in education area in surveying sector to be colleagues who were equipped with modern values, lives with developments, adapts leadership of mind, interrogator, and researcher and assimilated their occupation.

In this paper it was aimed to present all problems of geomatics education in Turkey; but it was tried to approach this problem with an integrated approach. It was aimed to determine current problems and to compile problems that were discussed until today and to make contribution to classify these. One of main messages of this paper is to emphasize the necessity of more participative, objective, patient and systematic remedies. The other one is our necessity to coordination and cooperation and to know us closely much more than ever. The steps to be taken on education will also be the indicator for what kind of a future we design? We can save future with steps to be taken from today on education and training.

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