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ENGINEERING COMPLETION PROGRAM STUDENTS' REASONS FOR UNIVERSITY AND PROGRAM PREFERENCES, PROBLEMS THEY EXPERIENCE AND THEIR SUGGESTIONS *

MÜHENDİSLİK TAMAMLAMA PROGRAMI ÖĞRENCİLERİNİN ÜNİVERSİTE VE PROGRAM TERCİH NEDENLERİ, YAŞADIKLARI SORUNLAR VE ÇÖZÜM ÖNERİLERİ

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ABSTRACT: Due to the low rate of employment, technical teachers wanted to be active in areas other than teaching. They faced a variety of problems since they did not have engineering degrees. To address such problems, programs were opened to help technical teachers earn their engineering degrees. This study used the qualitative research method to evaluate the engineering degree completion exam and programs with participants in different programs in the 2013-2014 academic year. The data in the study were gathered using a semi-structured interview form. The results revealed that the students took the exam to earn their engineering degrees and chose to attend universities located close to their place of residence. They identified problems such as transportation and accommodation due to the exam being held in only one location in Turkey. Most participants asserted that they were not able to attend classes because of their intensive work program, and were not able to study enough because of the exam schedule being announced late.

Key Words: Engineering Degree Completion Program, Engineering Degree, Technical Education Faculty

ÖZET: Türkiye'de teknik öğretmen unvanına sahip bireyleri mezun eden yükseköğretim kurumlarının yapılarının defalarca değişmesi, bu kurumları ders içerikleri ve öğrenim tarzı olarak mühendislik fakültelerine yaklaştırmıştır. Teknik öğretmen adayları, atamalarının çok az olması nedeniyle öğretmenlik dışındaki alanlarda da etkin olmak istemişler ve mezun olduğu alanlar haricinde işlerde çalışmaya başlamışlardır. Sektörde çalışmaları esnasında mühendis unvanına sahip bireylerle benzer öğrenim süreçleri geçirmelerine rağmen mühendis unvanına sahip olmadıkları için çeşitli sorunlarla karşı karşıya kalmaktadırlar. Bu sorunların giderilmesi amacıyla teknik öğretmen unvanına sahip bireylerin girecekleri sınav sonrası, alacakları fark dersleri başarı ile bitirmeleri neticesinde, mühendis unvanına sahip olabilecekleri programlar açılmıştır. 1993 ve 2002 yılları arasında senede bir defa olmak üzere toplamda 10 defa sınav yapılmıştır. 2002 yılından beri yapılması beklenen mühendislik tamamlama sınavı uzun yıllar sonrasında ilk defa 2013 yılında yapılmıştır (ÖSYM, 2014). 2013 yılı öncesinde ise Bulgaristan'daki çeşitli üniversitelerde TEF mezunlarının mevcut imza yetkisi problemlerine çözüm üretmek üzere mühendislik tamamlama programları düzenlenmiş olup tüm Avrupa ülkelerinde ve dünyada tanınırlığı bulunan "Mühendislik Tamamlama Programları" hayata geçirilmiştir (Universium, 2014). Yükseköğretim Genel Kurulu'nun 06.06.2013 tarihli kararı uyarınca, Ölçme, Seçme ve Yerleştirme Merkezi (ÖSYM) tarafından yılda bir defa olmak üzere Teknik Öğretmen unvanını almış mezunlar için Mühendislik Tamamlama Programlarına alım sınavı yapılacağı belirtilmiştir. 2013 yılında yapılan sınavda toplam 24 farklı teknik öğretmenlik dalından 16 farklı mühendislik tamamlama programına başvuru yapılmasına izin verilmiştir. Nitel araştırma yöntemi ile yapılan bu araştırmada 2013 – 2014 akademik yılında farklı programlarda öğrenim hakkı elde eden katılımcılarla, mühendislik tamamlama sınavı ve programları değerlendirilmiştir. Araştırmada yarı yapılandırılmış görüşme formu aracılığıyla veriler elde edilmiştir. Araştırma sonucunda elde edilen bazı sonuçlar, katılımcıların mühendislik tamamlama programının

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açılmasından memnuniyet duydukları, mühendis unvanına sahip olmak için sınava girdikleri ve mekân olarak kendilerine yakın üniversiteleri tercih ettikleri ifade edilmiştir. Ayrıca, sınavın tek bir merkezde yapılmasından dolayı ulaşım ve konaklama gibi sorunların ortaya çıktığı, çoğu katılımcının çalışan olmasından dolayı dersleri takip edemedikleri, sınav takviminin geç ilan edilmesinden dolayı sınava yeteri kadar çalışamadıkları gibi sorunlar ifade edilmiştir.

Anahtar Kelimeler: Mühendislik Tamamlama Programı, Mühendislik Unvanı, Teknik Eğitim Fakültesi

INTRODUCTION

Various positions in the industrial sector are filled by technical teaching graduates as the number of technical teachers on the market increases. However, not having the signing authority of engineers constitutes an impediment for them. Efforts to train professional and technical teachers for secondary education began nearly 80 years ago (Ulusoy; 2003, cited in Akpınar, 2005), when there were attempts to send students to European countries to get training, bring teachers from these countries, and open teacher training high schools in different periods. In time, new schools were opened in Turkey to meet the increasing demand in this respect. The need to increase the number of these schools and then to move the instruction done at these schools to higher education institutions became evident. For this reason, "Technical Education Faculties" (TEF) at universities were opened to meet the need for technical teachers with law number 41 on July 20, 1992 (Akpınar, 2005). Since then, the training of technical teachers has been conducted by higher education institutions.
Due to the alterations in the TEFs and new needs, these institutions needed to be modified. In 2009, the following decision was made to close the TEFs and found new faculties:

The closing of Technical Education Faculties, Vocational Education Faculties, Vocational and Technical Education Faculties, Trade and Tourism Education Faculties and Industrial Arts Education Faculties in various higher education institutions, and the founding of new faculties in the same higher education institutions was decided on by the Ministerial Cabinet on November 2, 2009 after receiving a letter from the Ministry of National Education on September, 28, 2009 (Official Gazette 2009).

Current students in the faculties that were closed as a result of this decision were able to continue their education until their graduation. According to this decision, 27 faculties at 22 universities were closed, and Technology Faculties (TF) were opened using the existing infrastructure. In other words, TFs were brand-new faculties, rather than a new form of TEFs. With regard to their engineering education programs and teaching staff, TFs were organized to graduate students with engineering degrees. With letter number 4407 on July 9, 2014, the Higher Education Council announced that the engineering degree received by engineer faculty graduates was no different from the engineering degree received by TF graduates (Higher Education Council, 2014). Thus, the problems with the title in the business world would be solved.

The primary aim of Vocational, Industrial Arts, Technical and Trade Tourism Education Faculties providing vocational and technical education at the higher education level is to meet the vocational teacher needs of secondary education institutions (Şimşek, 2007). However, the number of students who chose vocational high schools fell due to the field of study and field coefficient rule implemented in entering universities as of 1998. Although it was expected that interest in vocational education would rise with economical development, the opposite situation is being experienced in Turkey. Interest in vocational education fell in Turkey between the years 1996 and 2007 (Turkish Statistical Institute, 2008). Since the rising number of TEFs and the number of technical teachers who graduated from them was more than the Ministry of National Education needed, a number of problems arose. The vocational high schools had difficulty finding students due to falling interest, and this led to the teacher candidates who graduated from the Vocational and Technical Education Faculties not being hired by the Ministry (Şahin and Fındık, 2008). The unemployed graduates headed towards different business areas to use their technical skills, but they encountered problems such as low salaries, working in areas other than their major and not being able to find jobs at all (Akpınar, 2005).

With the changes in the programs at TEFs and other technical teacher training institutions, the number of applied courses was reduced, and engineering courses became more numerous (Akpınar, 2005). To a certain extent, this made up for technical teachers' lack of success on the job market, if they had engineering skills. However, their lack of engineering degrees continued to cause them problems. Another obstacle that vocational and technical education faculty graduates encountered was uncertainty about their educational status and competence (Şahin and Fındık, 2008). For this reason, changes needed to be made to address these problems.

After the engineering courses became more prominent, TEF graduates needed to obtain engineering degrees to be able to find jobs other than teaching. Furthermore, the graduates of the TFs opened in 2009 being able to earn engineering degrees made it necessary for TEF graduates to obtain this degree. A regulation named "Application Basis and Procedures Regulation for Engineering Degree Completion Programs Organized for Technical Teachers," published by the Higher Education Council in 1992 stipulates that technical teachers are entitled to engineering degree completion. The aim of the regulation was to identify the procedures for degree completion programs so that technical teachers can earn engineering degrees. It also stated that students who successfully completed the degree completion programs would be given engineering degrees in their area of study (Higher Education Council, 1992). This was intended to overcome one of the technical teacher's problems on the employment market. Under this regulation, ten exams were conducted once a year between 1993 and 2002 (Student Selection and Placement Center, 2014). The engineering degree completion exam that was supposed to be administered starting in 2002 was finally administered in 2013 for the first time. Before 2013, engineering degree completion programs were organized at various universities in Bulgaria to offer a solution to TEF graduates' signing authority problem, and engineering degree completion programs emerged and were recognized in Europe and the rest of the world (Universium, 2014). The June 6, 2013 decision of the Higher Education Council stated that a selection examination for admittance to engineering degree completion programs would be administered to technical teachers by the Student Selection and Placement Center every year. Applications for the exam administered in 2013 were received by 16 different engineering degree completion programs in 24 different technical fields. As a result of the exam, 2,791 of 14,926 candidates were placed in the programs they desired and all vacancies were filled (Student Selection and Placement Center, 2013). The courses that these students take differ based on the programs and were determined by the Higher Education Council.. Their decisions stipulated that a higher education institution had a right to change up to 30% of these courses and add up to 50% courses (Sakarya University, 2014). This gave every university the right to modify their curricula.

The lecture times of students in daytime or evening education varied based on the regulation. The completion programs are two semesters long, with two additional semesters for students who needed them to complete the programs and no further extensions (Higher Education Council, 1992). In 2013, the time limit was revoked, and these students became subject to rules no different from those of regular undergraduate students. This overcame working students' time constraints.

The literature does not contain sufficient research on the engineering degree completion program students' problems before and during the engineering degree completion exams, registration, and their course of study. This lack led to the decision to conduct this study, which examines why the students chose their programs, their problems before and during the program and their proposed solutions to these problems. This will reveal experiences and expectations and solve problems.

METHODOLOGY

This study used the qualitative research method and case study design. Semi-structured interviews were held with students in engineering completion programs at different universities in person or by telephone. The interviews were evaluated by two experts in the field, and findings were generated by content analysis. According to Stemler (2001), content analysis enables researchers to classify various groups of words in texts according to specific rules. The semi-structured interview

technique is defined by Özgüven (2004) as a method that enables researchers to make alterations to accommodate unforeseeable situations that may arise during an interview. The participants were asked to indicate their problems during their studies or the examination process, their solutions to these problems, their reasons for preferring a particular program and their reasons for taking the exam.

DATA GATHERING

The interview questions were prepared based on a review of the literature and interviews conducted at different times with six participants before the actual data were gathered. They were revised after consulting expert opinions. The questions were used on the semi-structured interview form. This interview method is described by Patton (1987) as an effort to get into the internal world of individuals, and understand and comprehend events from their perspective. Individuals' experiences can be better understood in their own words, sense-making and explanations (Türnüklü, 2007). The data gathering intended to reach as many as possible of the 2,791 students placed in engineering degree completion programs in the 2013-2014 academic year and to be comprehensive as possible. For this reason, invitations were posted a few times on the Engineering Degree Completion Program Facebook page, which has 2,314 members, but few responded. At different universities, most of the students did not want to participate in the study since the interviews were to be recorded. As a result, interviews were conducted with 18 participants in person in Istanbul, and on the phone with 14 participants from different cities in Turkey. All interviews were recorded. The interviews were conducted with each participant more than once. For more objective results, two researchers at the exam center observed the candidates who would take the exam a day before and on the exam day. In addition, one of the researchers attended courses for eight weeks with 12 participants in classrooms to gather more observation data.

DATA ANALYSIS

The data obtained by the study were interpreted using content analysis. Content analysis means combining similar data based on concepts and themes, and interpreting them by organizing them in a way that readers can understand (Yıldırım and Şimşek, 2008). The face-to-face and phone interviews were recorded with the participants' permission. The researchers took notes on their observations about the consistency of the interviews. All the interviews were uploaded to computers and analyzed using NVivo 8 software. The voice recordings were transcribed, and the analyses were conducted using this transcription. Two experts evaluated the analyses, to ensure their validity and reliability. The 32 participants were encoded as P1 through P32, and in the findings section, some of the participants' statements are presented as direct quotations.

RESULTS

This study aimed to identify Engineering Degree Completion Program students' views about the program. The data were analyzed, and the findings are presented below along with the student views based on the research questions. The findings were categorized as: problems with the exam and its results, problems with their preferences and during registration as prospective students and finally, problems during their studies.

Among the initial findings, it was found that the participants were pleased with the program and expected it to be continued. However, the participants identified a variety of problems with it, and five different themes were identified for them. In the figures for each theme, the numbers of participants who agreed with the statements is indicated to their right.

Reasons for Taking the Exam

The participants were asked to indicate their reasons for taking the engineering completion exam. The participants' answers are presented in Figure 1:

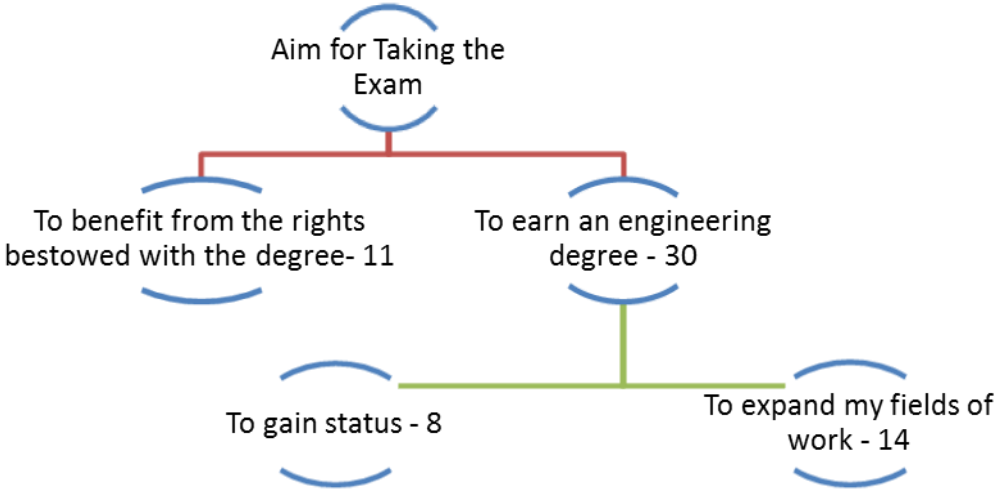


Figure 1: *Reasons for Taking the Exam*

As Figure 1 shows, when the participants were asked why they took the engineering completion exam, they responded with two types of answers: 11 participants responded that that wanted to benefit from the rights bestowed with the degree, and 30 participants responded that they wanted to earn an engineering degree. Eight participants stated that they wanted to gain status, and 14 participants wanted to expand their fields of work. Here are some sample responses:
P19: I regretted not fulfilling my youthful dream of becoming an engineer., I graduated from a vocational high school years ago.. So, when the opportunity arose, I thought that it would be great if I could accomplish this and took the exam.
P4: I wanted to attend this program so that I could overcome some problems in some private sector business areas by having an engineering degree.

University Preferences

The study asked the participants about their reasons for choosing their university. The participants' responses are shown in Figure 2:

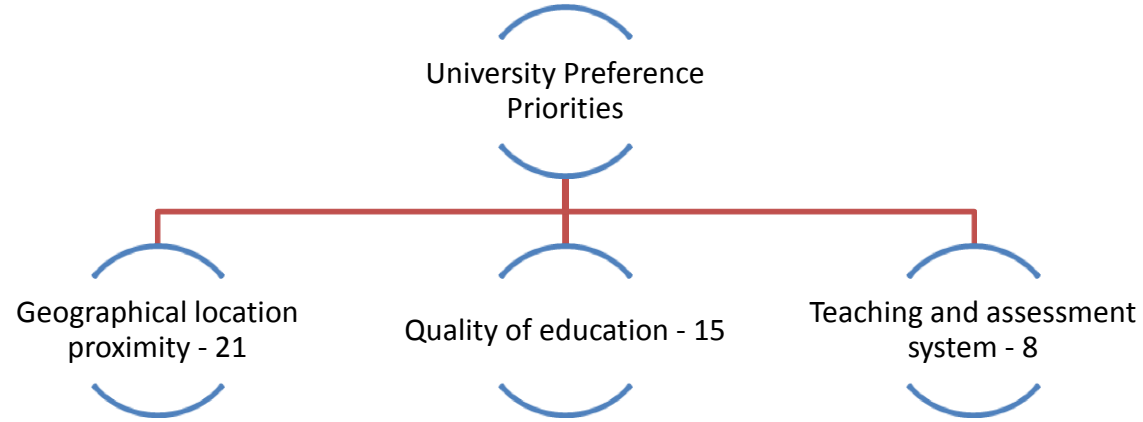


Figure 2: *University Preferences*

After the results were announced, the students chose 15 universities using the guide published by the Student Selection and Placement Center. Three factors were effective in these preferences. These factors were the teaching and assessment system according to 8 participants, geographical location and proximity according to 21 participants and the quality of education according to 15 participants.

Among these factors, the geographical location and proximity was the highest priority. Here are some sample responses:
P23: Since I was working in Istanbul, I wanted to study in Istanbul, too. My first choice was Istanbul University, which is closest to me. Since I was working during the day, evening classes were an advantage for me and that was my primary reason for preference. The reason I specifically chose Istanbul University was the quality of education there. Of course, I also took my score into consideration. Considering that the necessary score for Istanbul Technical University would be high, I decided to put Istanbul University as my first choice since it would require fewer points. So, these are the factors I considered .
P9: I chose this university because it was close to my workplace, and I thought I would be able to make it to the classes.

Problems

After the interviews were conducted, the participants were asked about problems with the exam and its results, problems with university selection and registration and finally, problems with their studies. The themes of their responses are presented in Figure 3:

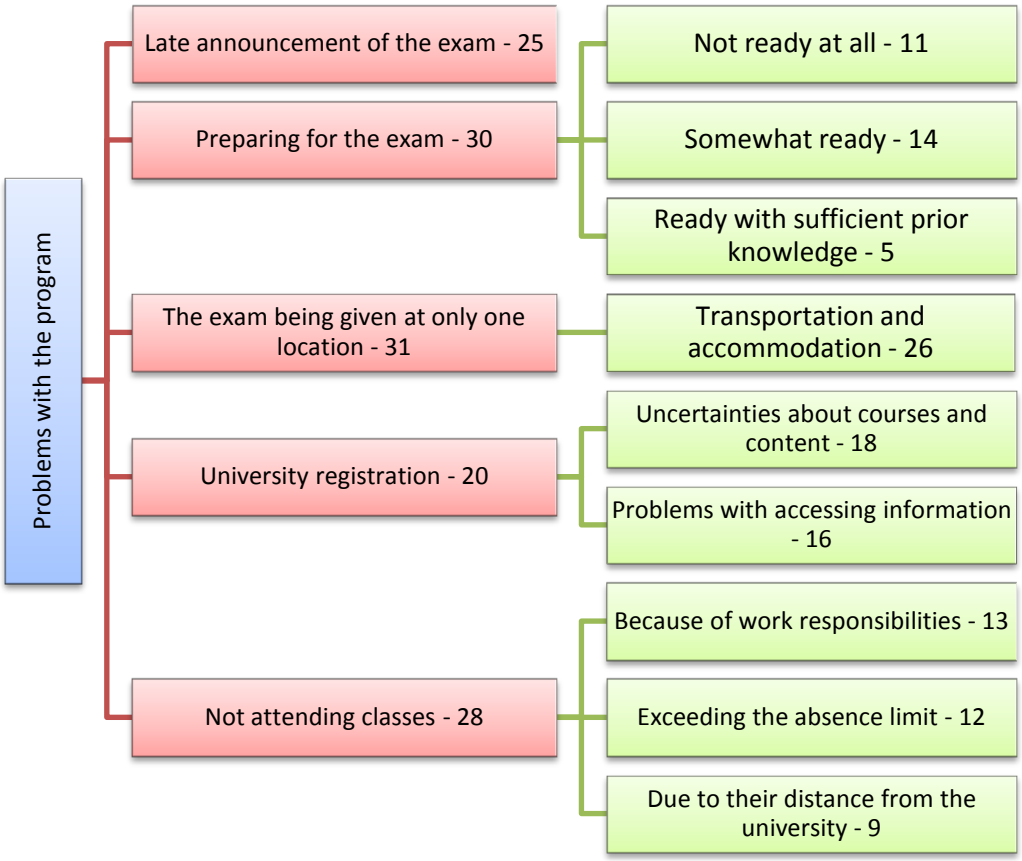


Figure 3: *Problems with the program*

One of the issues the study focused on was the problems with the program. As Figure 3 shows, the participants encountered many kinds of problems. Among the problems with the exam and its results, 25 participants indicated that the exam was announced quite late. For this reason, 11 participants said they were not able to prepare for it, 14 participants said that they were somewhat prepared for the exam, and 5 participants said that their prior knowledge was sufficient for the exam. Furthermore, almost all the participants said the exam being given at only one location was a problem for them. The exam was administered in Ankara, which caused transportation and accommodation problems for 26 participants. Regarding problems with registration, 18 participants said they had uncertainties about the courses and their content, and 16 participants mentioned problems with accessing information.

Finally, during their studies, 13 participants said that they could not attend classes because of work responsibilities, 12 said they exceeded the absence limit, and 9 asserted that they were not able to attend the classes due to their distance from the university. Here are some sample responses:
P8: At first, something referred to as difference courses was signed papers. Documents were signed by the rectors of different universities and the Higher Education Council. There were very few courses here. The press said there were 3 courses in the first term and 3 courses in the second, a total of 6 or 7 courses. To train engineers, they were offering 10 courses. Universities can increase this number up to 50%. They organized 15 courses for us. And I took 7 of them back at the technical education faculty, and the contents were the same. They didn't give any exemptions, so we have to take 15 courses.
P26: In fact, I think, the number of the courses we had to take was already certain. The schools were told that they could raise the number up to 15 courses. This would include both compulsory and elective courses. They gave us compulsory courses that were normally elective courses. This program was organized with the faculty members' concern for being paid for extra classes.
P14: Everyone going to Ankara for the exam since the exam was administered in the capital, accommodation, eating, finding the exam center, etc. For instance, one of my friends came from Malatya, arrived in Ankara around seven in the morning. I was able to rest a little, but my friend took the exam without getting any rest and failed the exam.

Solutions to these Problems

After the participants described the problems with the engineering degree completion programs, they were asked to propose solutions, which are presented in Figure 4.

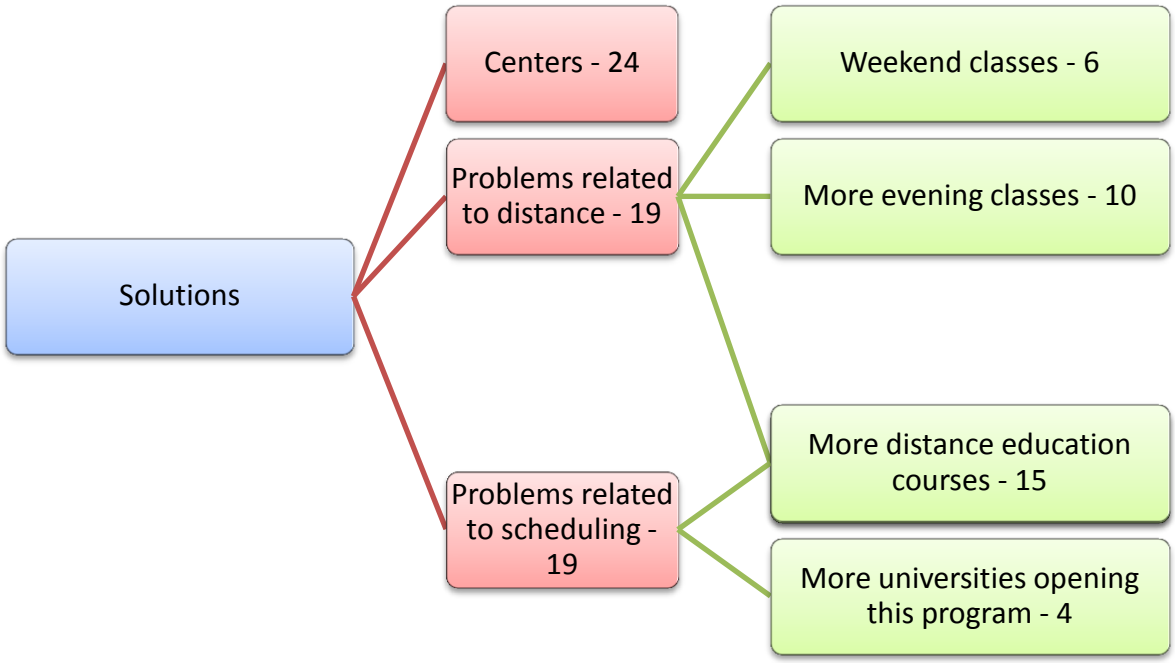


Figure 4: *Solutions to Problems*

Twenty-four participants indicated that the exams should be administered in more exam centers. To resolve problems related to distance, 6 participants said that weekend classes should be opened, and 10 participants said the evening education classes should be increased. Regarding problems with scheduling, 4 participants said that more universities should open this program. Finally, 15 participants said that if more courses were offered as distance education both sets of problems would be reduced. Here are some examples of the participants' responses:
P16: There should be proficiency exams like in distance education. Okay, proficiency exams could be administered for passing courses. I make this suggestion because it was very difficult to attend the classes. You know, not all the universities had this program and opened classes. I work at 9 Eylul University, but had to choose Ege University because 9 Eylul did not open this program. Then, there

can be a few departments that use distance education. Otherwise, 40 people are assigned to Ege, but only 3 can attend the classes. So, my biggest problem was attendance. I can say this with no doubt.
P27: There could have been a standard. All universities were given a certain number of vacancies, and this should have been be clearly identified so that it would not be left up to the universities.
P10:Maybe some of the courses should have been given as distance education. Maybe the number of applied courses where we can perform our skills should have been increased. These are the things I can think of right now.

Concerns for the Future

The participants were asked to indicate their concerns about their future after graduation. The findings are presented in Figure 5:

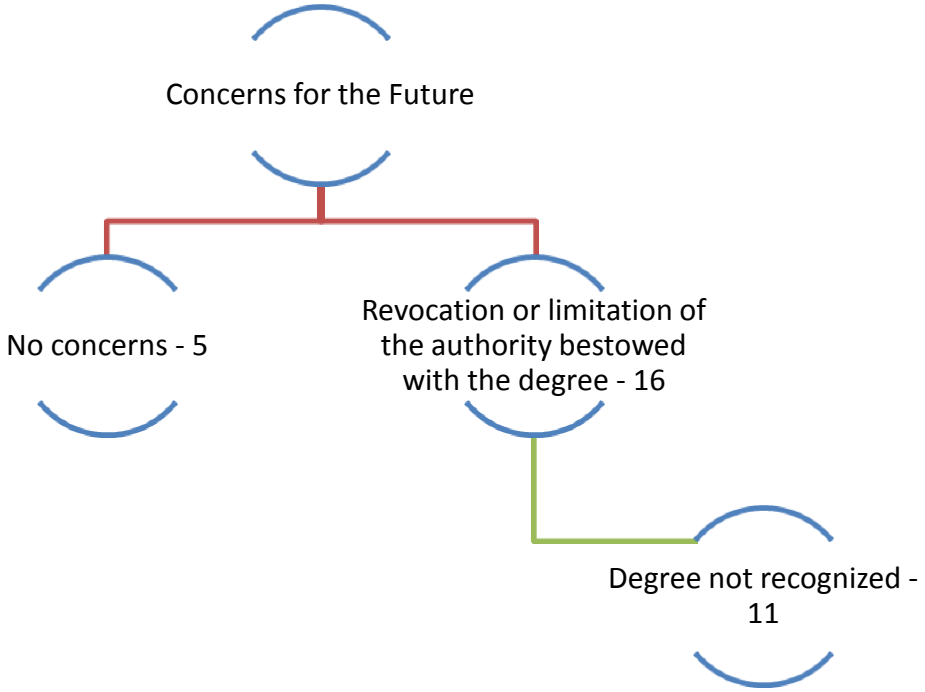


Figure 5: *Concerns for the Future*

The participants were asked about their anxieties regarding the diploma they would receive when they graduate. Only 5 of the participants had no concerns since this opportunity was a legal right entitled to them. Of the participants, 16 were concerned that the authority of the degree might be revoked or limited. In addition, 11 participants were concerned that the degree would not be recognized by the chambers of engineers or the sector. Here are some sample responses:
P25: Of course, we have concerns. A lawsuit has been filed by the chambers of engineers. When they would not accept this lawsuit, would Higher Education Council apologize to us by saying that they did something wrong by placing us into these programs? We have a legal right. We have earned the right to this diploma under this law.
P9: Yes, I have received my diploma, but I have concerns since there is a note on my diploma saying that it was granted by an engineering completion program. I doubt whether there will be a difference between me and others when I apply for a job. I graduated from an engineering faculty, but there is this note on my diploma. I have some concerns because of that. In the future, some people may say that they won't accept it. Chambers of engineers may not accept it.

DISCUSSION

The problems that the participants had with the exam included its late announcement. This led to some participants not being able to prepare for it, some being not fully prepared and others being prepared only because of their prior knowledge. In addition, almost all the participants said that having exam be administered in a single city caused them transportation and accommodation problems. Lack of information was mentioned by the participants and has also emerged in other studies as a problem (Tuncer and Kaysi, 2011; Kacur and Atak, 2011). This shows that students solve their problems by doing research on their own or asking their friends. Sometimes, however, they do nothing (Kacur and Atak, 2011; Topkaya and Meydan, 2013). For this reason, every organization should be careful to provide accurate information to its members.

The problems the participants had as prospective students were uncertainties about which courses they should take, their undergraduate courses not being recognized and other problems with registration. The main problem that the participants had during their studies was not being able to attend classes and sometimes exceeding the absence limit due to scheduling problems and long distances to the university. In particular, helping out working students can improve their attitudes towards classes As Chang and Chang (2013) argue, we should understand students' problems with their learning processes and offer them support within the shortest time. It would also be helpful if faculty members be trained about these problems (Tuncer and Kaysi, 2011). Thus, we can positively affect students' attitudes and motivation to learn. Students' low motivation has been shown to be among the factors that affect their achievement negatively (Kaysi, Aydemir and Gürol, 2014). Similarly, as Ertem (2006) notes, motivation is an element important for learners to be successful. High motivation may reduce the effect of negative factors in academic achievement. In other words, motivation is an important factor in learning outcomes (Chen, 2001).

The participants said that they chose their university by geographical location and proximity, quality of education and the teaching and assessment system in that order. One of the factors that affect the choice of a university is the individual's socioeconomic level (Çermik, Dogan and Şahin, 2010). Transportation is a problem for students (Karaguven, 2000; Tuncer and Kaysi, 2011). For this reason, the participants chose local universities. Another prominent factor in their choice was the university being close to their workplaces. Since their diplomas are annotated to indicate that they graduated from an engineering degree completion program and the Chamber of Engineers has filed a lawsuit against this program, the participants had anxieties about the future of this program. Some mentioned the possible revocation or limitation of their authority as engineers. These findings are consistent with the students' anxieties about finding a job after graduation in Topkaya and Meydan (2013), Karagüven (2000), Özgüven (1992), Gizir (2005), Bilgin (2001), and Acar (1986). As Tuncer and Kaysi (2011) also claim, an important part of these problems can be overcome by external support.

The participants said that their reasons for taking the engineering degree completion exam was to earn engineering degrees, to gain status, to benefit from a right to which they are entitled and to expand their fields of work. The participants' proposals included weekend classes, distance education and more evening classes. They thought that having some of the courses being given in classrooms and some as distance education would be more useful. This method, blended learning, was perceived by the students as more satisfactory, like in Dos' study (2014). Finally, they said that administering the exam in more than one city would solve their problems with transportation and accommodation.

CONCLUSION AND SUGGESTIONS

Students' views of the long awaited engineering degree completion program for technical teachers in 2013 show the problems and proposals for their solution. They can guide future planning of the examination and coursework. The participants' statements revealed many different problems with

the exam and their coursework. Some of these problems were related to the exam. Some were related to their choice of university and to registration, and some were related to their studies.

The participants favored the opening of these programs enabling technical teachers to earn engineering degrees by completing courses that are referred to as difference courses. They took the exam to earn engineering degrees in addition to their qualification as technical teachers, and chose their universities based on proximity. There were unforeseen problems since the exam was being administered for the first time in 10 years. The participants mentioned problems with transportation and accommodation since the exam was only held in Ankara. Most participants were not able to attend classes because of their work responsibilities and were not able to study enough because the exam was announced late. Their most important reason for preferring the program, the aim of gaining the engineering degree was emphasized. The participants considered proximity and education quality to choose their universities. Finally, the greatest anxiety of the students was that their engineering degree might not be recognized or be partially revoked.

The results of this study suggest that:

- The exam should be administered in more than one city in Turkey to solve the candidates' problems with transportation and accommodation.
- To enable the working students to attend classes and be more successful, the number of evening education classes should be increased, and some courses should be offered as distance education.
- The anxieties of the students about their degrees should be resolved.
- Obtaining the views of engineering degree completion program graduates can reveal different perspectives on the implementation of these programs.
- Conducting studies that focus on students or graduates' views of the courses in engineering degree completion programs, or that compare their prior educational experiences to the engineering degree completion program can offer new data to the field.
- The results of this study should be used to develop a quantitative data-gathering instrument for students in engineering degree completion programs. After this instrument is administered, the results should be compared to those of this study.

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