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An Analysis of Mathematics Education Quality: Case Study of Adiyaman University

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ABSTRACT

There is no doubt that fast and intense changes in the communication technologies of the globalized world have dramatically influenced the educational instituions as well as other sectors. Increasing demand for lifelong learning have been shaping educational institutions and emerging information society structure. The changes affect educational instituions in the way of requiring to bring up more qualified people who can contribute to information production and use it creatively.

The main subject in service sector is human. The offering of qualified service is possible through qualified workers. Qualified human resource is developed by vocational education. When we look through a wider perspective, the role of the educational opportunities provided in higher education institutions is an undeniable fact in terms of the provision of sustainability in service quality.

The service offered to the students in universities should be designed and offered in a way to meet the expectations and needs of students. The atmosphere should be created for the students to attend to and adopt the courses and to take the information which is conveyed to them. The education which is offered in the level of student skill should contribute to their lives, increase their commitment to the university and the education to be offere in universities therefore should reach their aim.

Just like in all other service sectors, the inseperable, abstract, heterogenic and varible features of services offered in universities create hardships for performing measurement in this issue. In this study, the measurement of the expectations of students in the university from mathematics education and the service quality percieved in this sense are performed.

The main group is comprised of the students of Adıyaman University. The total university student number in the year when the poll is conducted (in 2012) is 12.000. The sample volume for the poll is determined as 400 students and the poll is performed. During the prescreening, 84 survey forms belonging to the included working group were detected not to have been filled correctly and not included in the analysis stage.

In this context, educational quality has become a priority for all educational institutions. Educational quality of higher education institutions is both an indicator of development and the most prioritized driving factor of related efforts. The expectations and satisfaction levels of the studenst who are the 'customers' of higher education institutions are examined in this study. This article is a study for determination and optimization of the mathematics education quality for students who are studying in Adıyaman University.

Keywords: Education Management; Optimization; Products; Services; Planning; Quality; TQM
The Type Of Research: Research

Matematik Eğitim Kalitesinin İncelenmesi: Adıyaman Üniversitesi Örneği

ÖZET

Globalleşen dünyada iletişim teknolojilerindeki hızlı ve yoğun gelişmeler tüm sektörleri etkilediği gibi hiç şüphesiz eğitim kurumlarını da büyük ölçüde etkilemiştir. Yaşam boyu eğitime olan artan talep, kuşkusuz eğitim kurumlarını ve ortaya çıkan bilgi toplumu yapısını şekillendirmektedir. Süreklilik arz eden bu değişim; evrensel değerlere açık, bilgi üretimine katkıda bulunabilen, bilgiyi yaratıcı biçimde kullanabilen, daha nitelikli insan yetiştirme zorunluluğu çerçevesinde eğitim kurumlarını da dönüştürmektedir.

Bu etkinin doğal bir sonucu olarak tüm eğitim kurumları, güncel programlarını gereksinimlere uygun ve daha işlevsel hale getirmek zorundadır. Bu kapsamda, odaklanılan ana konunun kalite olduğu ve eğitimde kaliteyi arttırma çalışmalarının tüm eğitim kurumları ve küresel rekabette yer alan ülkelerin gündeminde olan bir öncelik olduğu gözlenmektedir.

Üniversitelerde öğrencilere sunulan hizmet, öğrencinin beklenti ve ihtiyaçlarına cevap verecek şekilde tasarlanmalı ve sunulmalıdır. Öğrenciler için derslere uyum, katılım ve kendilerine aktarılan bilgileri alabilmelerine yönelik ortamlar sağlanmalıdır.

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Öğrencilerin becerileri ölçüsünde verilecek eğitim yaşamlarına katkı sağlamalı, onların üniversiteye bağlılıklarını artırmalı ve üniversitede verilmek istenen eğitimde bu kapsamda amacına ulaşmalıdır.

Hizmet sektöründe, temel öge insandır. Kaliteli hizmet sunumu, nitelikli çalışanlarla mümkündür. Nitelikli insan kaynağı ise mesleki eğitimle yetiştirilmektedir. Olaya geniş çerçeveden baktığımızda, yükseköğretim kurumlarında sağlanan eğitim olanaklarının hizmet kalitesinin sürekliliğinin sağlanmasındaki rolü yadsınamaz bir gerçektir.

Tüm hizmet sektörlerinde olduğu gibi üniversitelerde sunulan hizmetlerin; ayrılmaz, soyut, heterojen ve değişkenlik özellikleri bu konuda ölçüm yapmayı zorlaştırmaktadır. Çalışmada, öğrencilerin üniversitedeki matematik eğitiminden beklentileri ile bu manada algılanan hizmet kalitesinin ölçümü yapılmıştır.

Ana kütleyi Adıyaman Üniversitesi öğrencileri oluşturmaktadır. Üniversitede anketin uygulandığı (2012 yılı) zamanda toplam öğrenci sayısı 12.000 kişidir. Ankette örneklem hacmi 400 kişi olarak tespit edilmiş olup, anket uygulaması yapılmıştır. Anketlerin kaydedilmesi aşamasında 84 adet anket ön elemeden geçirilmiş ve sağlıklı doldurulmadığı tespit edilerek, analiz aşamasına dâhil edilmemiştir.

Yükseköğretim kurumlarının eğitim kalitesi, bir ülkenin gelişmişlik düzeyinin göstergesi olduğu gibi, bu yönde sarf edilen çabaların en öncelikli itici faktörlerden biridir. Yükseköğretim kurumlarının 'müşterileri' olan öğrencilerin, matematik eğitiminden beklentileri ve tatmin düzeyleri bu çalışmada araştırılmıştır. Bu makale, Adıyaman Üniversitesi'nde öğrenim gören öğrencilerin matematik eğitim kalitesinin tespitine ve iyileştirilmesine yönelik bir çalışmadır.

Anahtar Kelimeler: Kalite, Matematik Eğitimi, Eğitimde Kalite Yönetimi, Optimizasyon, Ürün, Servis, Planlama.

Çalışmanın Tütü: Araştırma

1. INTRODUCTION

The increase in our life standards highly depends on the quality in service sector and the increase in the efficiency. (Deming, 1994) The education service which takes place in service sector is both subject and object of the sector because it both takes place in the sector and grows people for it. The universities which take place in educational institutions certainly have the most important place for the development of countries; the increasing sustainability of this process is possible through quality awaremenss and practices.

In parallel to the reflection of globalization and the effects of this change, service sector has had a more important condition than other sectors in our country as well as the entire world. The developments and alterations in the fields of health, finance, law and education have resulted in the variation for service types in these fields and a huge increase in the number of operations. With the outward-oriented economy strategies, the service sector in our country began to move after 1990s (Öztürk, 2005).

The provision of quality in education is a very complex issue and this complexity is resulted from the features of both education and service sector. Today the educational institutions on all levels use the approach and techniques of total quality management as a system and in accordance with this approach; they take it as a goal to install efficient, successful and productive systems (Arıkboğa, 2003).

The main subject in service sector is human. The offering of qualified service is possible through qualified workers. Qualified human resource is developed by vocational education. When we look through a wider perspective, the role of the educational opportunities provided in higher education institutions is an undeniable fact in terms of the provision of sustainability in service quality.

Education is a kind of service. The universities which are the higher education institutions produce service. Universities which take place in education sector today compete with each other both among themselves and on international level. Optimizing and developing the service quality, the universities come to the fore front in the intense competition environment today and they have the leading position (Güzel, 2006). The universities are subject to international rankings considering some criteria such as the increase in the education level which they provide for their students and the rate of scientific publications by the academicians; and they are concerned as qualified.

The service offered to the students in universities should be designed and offered in a way to meet the expectations and needs of students. The atmosphere should be created for the students to attend to and adopt the courses and to take the information which is conveyed to them. The education which is offered in the level of student skill should contribute to their lives, increase their commitment to the university and the education to be offere in universities therefore should reach their aim.

Just like in all other service sectors, the inseperable, abstract, heterogenic and varible features of services offered in universities create hardships for performing measurement in this issue. In this study, the measurement of the expectations of students in the university from mathematics education and the service quality percieved in this sense are performed.

2. TOTAL QUALITY MANAGEMENT (TQM) IN EDUCATION

The notion of quality was born with the production relations-regardless of time and place-in the world and it has continued as a very interesting subject throughout history. It is argued that the first records related to quality awareness date back to Hammurabi Laws (2150 BC), the appearance of the quality as a notion and its usage in scientific literature coincide with the beginning of industrial era.

Total Quality Management (TQM) is a management model which aims at the long term satisfaction customer satisfaction, provision of contribution for its own personnel and society and which focuses on quality and is based on the participation of the entire personnel (Efil, 1995). TQM is a management method which tries to meet the quality demands of inner and outer customers and to create the quality defined by the customers within the structure of product and service by means of the optimization of the products and services by participation of the entire personnel in an organization (Soylu vd., 1998). TQM is a management method which creates quality prioritizing the expectations of the customers and defined by them within the scope of the products and services during the operation of all activities (Aydınceren, 1993). In short, total quality approach is a continuous process for satisfying the customers and is a voyage to perfection.

The educational institutions seek to reform the education system in order to make their schedules more appropriate and functional in accordance with the current needs and expectations with the knowledge and experience of past for catching the social change. Accordingly, it is seen that the main focus is quality and it is regarded as a priority for all studies by the institutions to increase the quality in education.

2.1. Instructor and Quality

Today, the instructor should be a guide who shows the way to information sources, can be promoter and teaches how to learn instead of the person who organizes, manages, control the education and conveys what they know to students. Instructor has to try to gain these skills or to have these skills in parallel to current requirements. This is the demand from today's education system and education at all. The change in the duties and responsibilities of an instructor can be well understood from the Table 1 in which the roles of a traditional and modern instructors' duties.

Table 1. Comparison of Traditional and Modern Instructor's Duties

Traditional Instructor	Modern Instructor
Majored in one subject.	Majored in combined subjects.
In position of giving information.	In position of guiding the educational life.
Making students passive for giving and repeating information themselves.	Keeping students active.
Not allowing students in program development process.	Allowing students in program development process.
Giving importance in memorizing the given information and presentation in the same way.	Applying the method of exploring.
Giving more importance in outer signals than inner ones.	Giving importance in inner signals.
Teaches students in classroom.	Teaches for students. Giving importance in group works. Student learns everywhere. Giving importance in creativity.

(Varış, 1988)

Efficiency of instructor is the most important factor which directly affects the quality of education. The awareness of qualification and competencies related to instructors, as well as in other professions has a great importance in terms of awareness related to profession of teaching, defining the duties and responsiblities of instructors, increasing the performace of instructor and growing qualified instructors suitable for profession of teaching. Since the quality of instructors directly influence the quality of education, the success of education system is closely related to the instructors who carry out that system.

2.2. Education and Quality

Because of the fact that the mistakes to be made in education, the correct planning and presentation of education from the very beginning is highly important for educational institutions and the future of country. The cost of the cheapness to occur when this importance and awareness is ignored will cause huge amount of costs and bills to both the educational institutions and country.

Today the education systems are reshaped within the frame of the rapid changes in science and technology and the need for labor force demanded by the society. (YOK, 1998) Accordingly, within the frame of national education development project themed "Standards and Accreditation for Teaching Instructors in Turkey" carried out by YOK (The Board of Higher Education) and the World Bank (YOK, 1999a); it is seen that standards related to education are tried to be determined.

The mentioned standards are defined as;

1. Planning, applying and evaluating the education,
2. Instructors,
3. Students,
4. Cooperation of faculty and school,
5. Facilities, libraries and equipments,
6. Management,
7. Quality assurance.

Within the study, the beginning, process and product standards for each dimension are expressed in details and how the standards are used is explained.

Standards are the foundation of accreditation. They present the requirement of the system to be installed and define what to be done for the development of high qualified lisanse programs. Standards are determined in accordance with the opinions, researches and experiences of the experts. In a system which is designed for accreditation of higher education programs, the standards show which elements should take place in the program in order to decide a higher education program to be acceptable (YOK, 1999b). Standards are determined by traditions, common agreement and an authority; and can be defined as a role modal or sample. On the other hand, these standards can be defined as necessary and sufficient qualification levels for achieving a goal (YOK, 1998).

Within the last ten years, in parallel to the rapid increase in the number of higher education students, the developments such as the height of private presentation style share and the improvements of the autonomy of state universities bring the problem of "quality assurance" in higher education for the entire country. Due to the international student roaming, universities beyond borders and free roaming of services in globalizing economy; the quality assurance has both national and internatioal dimensions; and the issues like recognition of diplomas and accreditation have become significant agendas for mutual or multiple relations (YOK, 2007).

By the year 1995, the efforts of creating close relations to European Union and the integration process gain momentum. Within the frame of standardization of higher education process and systems in our country with European Union, steps are gradually taken in the "Process of Bologna." Within this sense, it is seen that the importance given to education quality standards for today's requirements is increasing. The efforts for more international student and personnel exchange between higher education institutions and for creating stable programs bring the education service and sector into an international position which makes the competition and quality in this field inevitable.

It is observed that the developed countries have great benefits from determining and applying the quality standards for education. Today when the height of education level is a basic indicator of being developed, especially the developing countries are spending efforts for providing their education systems with a structure having modern standards in order to catch up with the competition. Therefore, it is necessary to question the appropriateness of the standards in our country and to develop them. While performing this questioning, it is inevitable that the elements related to growing instructors are discussed in multiple ways.

2.3. Mathematics in Education

Mathematics is usually misunderstood by the individuals. This perception is caused by the fact that mathematics is comprised of complex numbers, symbols and shapes. However, mathematics is not a science tool which is tried to be defined by those who have no knowledge about complex notions made up of numbers used in daily life or about the nature of mathematics (Sertöz, 1996).

Creation of mathematics culture in society is provided by the basic mathematics education taken place in primary and secondary education. In higher education institutions where the philosophy of mathematics is studied, it is taken as a goal to study mathematics discipline as in European countries, to teach mathematics more comprehensively and to increase the mathematics education quality.

Considering the philosophic side of mathematics, we can talk about two approaches for its creation. One of them is "that math is invented by people" and the other is "that the math already existing in universe is found by the people." The second approach is to show the mathematics in daily life with examples. It is possible to see the optimization examples known as a branch of math but coming to the fore in every field in; the plant of bean chooses helix as the shortest way to reach a certain height, a bee uses proper hexagons for covering a space with less material, celestial bodies draw ecliptic routes and a sunflower has the seeds with regular intersecting curves. The fact that everything in universe act determinedly and this determination is matched with mathematical connections lead us to this point; Mathematics is the information produced by the human mind which is inspired by the environment and makes abstractions with a first move (Altun, 1998).

2.4. Quality Approach in Mathematics Education in the World and Turkey

Countries hold competitions for some studies and encouragements in order to measure or show their education quality on an international level. These studies aim at always being leader in terms of education quality and bring about the standardization in education. Withn this scope, Governors Conference was held in Charlottesville, Virgina in United States of America in September, 1989 and a goal such as "Students of the Unites States of America will be the first in the world in terms of Mathematics and Science till the year 2000" was determined. Within the same year, the Education Department of USA announced eight goals and presented the educational strategies and goals for themselves as the fifth goal; "Students of the Unites States of America will be the first in the world in terms of Mathematics and Science" (The Education Department of USA, 1989).

Moreover, the activities which determine the educational successes and qualities of students in global level can be listed as:

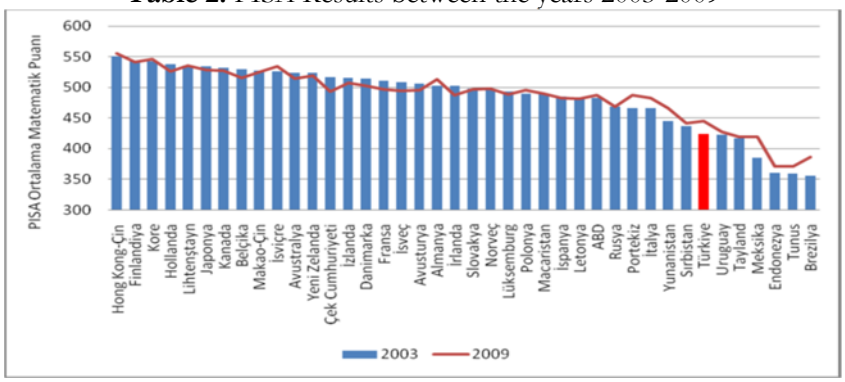
- PISA (Özenç and Arslanhan 2010:1)
- TIMMS (Gonzales, et al, 2004)
- International Olympics.

PISA- (Programme for International Student Assessment); this program is comprised of the initial letters of Programme for International Student Assessment. PISA is an international eveluation project which was started in Paris in 2000 for the first time and held in every three years; it aims at measuring the successes of students. PISA application allows the schools in different countries to be evaluated and compared; therefore it presents very interesting, beneficial, teaching, correcting and improving lessons. Within the frame of this project, the skills of students in four different fields are measured; 'Mathematics, Science, the Skill of Reading and Problem Solving.

According to the 2009 results of PISA which is one of the quality measurement tools for today's education systems, the developments in education quality of countries can be examined. PISA program is commonly used for comparison of education performance of the countries on an international platform. With the PISA exams, different skill levels of 15 year ol students from different countries are measured and compared. It is taken as a goal to measure the capacities of students to use their knowledge in daily life along with their academic knowledge level and especially their competence to solve problems. Moreover, the polls applied to the students, parents and school administration can analyze the reasons of success or failure. PISA exams were performed in 40 countries (30 of them are the members of OECD) in 2003. 17 new countries were included in the program in 2006 and the number of the countries increased

to 57. The number of the countries included in the exams carried out in 2009 was 65. Turkey attended to PISA in the mentioned years with 4855, 4942 and 4996 students successively (Özenç and Arslanhan 2010:1).

Table 2. PISA Results between the years 2003-2009



(Özenç and Arslanhan 2010)

Evaluated among the 40 countries included in the program in 2003, Turkey increased from the 35th ranking to the 33rd in the field of science and mathematics. In 2003, Turkey left Uruguay and Serbia-which had similar rankings in the mentioned fields-behind in the year 2009. For the evaluations related to the reading skills, it came before Russia and increased from 33rd ranking to 32nd. Consiering the 65 countries included in the program in 2009, Turkey ranked 43rd in the field of science and mathematics; and 41st in the field of reading skills. In the PISA 2009 results; it is seen that Turkey showed improvements in both rankings and in the scores for reading skills, mathematics and science, compared to 2003. While the average mathematics score in 2003 was 423; it increased to 445 in 2009. Similarly, the average science score was 434 in 2003 and it increased to 454 in 2009. As for reading skills; the score increased from 441 to 464 within the years 2003-2009. Considering the OECD average alterations in 2003 and 2009, differences can be observed in the scores for reading skills, science and mathematics (MEB-The Ministry of National Education, PISA Workpaper, 2009).

The mathematics education quality in Turkey can be obviously seen in the degrees taken from international mathematics Olympics. In recent years, TUBITAK (Scientific and Technological Research Council of Turkey) has given great supports to project which includes young students from different fields. The interest in mathematic-beginning for the children at an early age-the spirit of research and the motivation of advisors help us to be in the front rankings in the field of mathematics education globally. Turkey has begun to take place among the most successful countries in the world in mathematic Olympics on both individual and country level. Not only the number of medals but also the numbers of the students who win medals increase in the international mathematic Olympics.

The students who represented Turkey for international mathematics Olympics within the last four (since 2008) years have won 9 golden, 10 silver and 5 bronze medals. In 2012, the students who won golden, silver and bronze medals in European Ladies Mathematics Olmypics which were held in England put their names under significant successes. 5 golden, 6 silver and 1 bronze medals were won in 29th Balkans Mathematics Olympics. One of the most respected universities in the world; California Los Angeles (UCLA) University chose a student from Turkey for accepting a student in the department of mathematics in accordance with the success which is gained within the mathematics Olympics started for the first time in 2012. The Chamber of Supporting Sciencetists of TUBITAK (BIDEB) provides education for not only the students but also the instructors who give consultancy services within the preparation process for Olympics. TUBITAK-BIDEB has provided nearly 300 secondary school teacher with education withnn the last three years. Thanks to these educations, it is expected that the success of country will increase in International Science Olympics (Tubitak web page, 2012).

While the average in mathematics of OECD was 500 in the year 2003, it partially decreased to 496 in the year 2009; similarly the reading skills decreased from 494 to 493. Different from these two fields, the average of science score was 501 in 2009; it was 499 in the year 2003. While compared the PISA mathematics average of countries in 2003 and 2009; it is seen that excluding some expectations (Swiss, Germany, Poland etc.) the average scores of the countries which had high performances in 2003 remained the same or partially decreased within the year of 2009. In spite of that, the countries which had bad performances remaining under the second level or lower reached higher average scores within the year of 2009. Turkey is one of the countries which increased its scores most within this group (Özenç and Arslanhan 2010:3).

2.5. The Function of Instructor in Mathematics Education Quality

Sources related to the efficient learning make some suggestions about the quality for mathematics education (Chambers, 1987). The qualifications of a good mathematics instructor can be listed as; keeping students motivated in classrooms, keeping the half of the course for new materials, repeating the information, emphasizing the notions and its relations, stressing about directing thinking skills, asking series of questions, checking the comprehensions of students and using several structures. (McKinney, 1987) argues that the qualifications of a good mathematics instructor are efficient time usage and regular course and knowledge content.

(Evertson, 1980: 167) defines the efficient math instructor as"meeting the need of a group within a confirmed system in which several people have an agreement;" not as having some certain knowledge.

In today's conditions, having the knowledge is not regarded as that important anymore. It is accepted as a base to give this knowledge by harmonizing it with other information in a qualified way to the student community in accordance with the demanded educational standards. The technological sources make the access to information very convenient today; and the entire community-students being in the first place- are facing with the information bomb. Today, people do not need any kind of information; but they need the information which is the product of intense studies and examinations. At this point, huge responsibility falls on the shoulders of the qualified instructors. The instructor should scan the information, choose it from the best resource, arrange, analyse, interpret, absorb and present it in order for the learners to understand easily in a safe, necessary and sufficient way.

2.6. The Influence of Technology on the Quality of Mathematics Education

Technology-especially the computing technologies-has entered in every field of today's world. One of these fields is occupied with the education and science sectors. For the mathematics which is defined as abstract notions, people have benefited from the computer since the year 1970. The computers and some mathematical software such as Visual Basic, Mathematicsematica, MatLab, Derive, Inspiration, Exell, MathematicsCad, Advenced Grapher, SPSS, and Geometer's Sketchpad during the process of turning from abstract notions to the contrete ones try to increase the quality of mathematics education. However, due to the fact that there are not sufficient qualified/competent instructors who have the required background and infrastructure in most of the higher education institutions, it is an undeniable fact that problems occur when these programs are applied to the mathematics departments. Technology both changes the wat of living in every field and turns dramatically the education systems into interactive education modals. Even though the devices such as television, video players and recorders and so on do not have big roles in mathematics education, the computing technologies have a rather significant role in mathematics education (Reys, 1998).

(Heddens and Speer, 1997) today's technology have begun to change especially the mathematics learning processes as well as in every other field. In addition to increasing the interest and knowledge of students, the technological devices which are used by the instructors also improve the quality of mathematics education. It is very difficult and complex for the instructors who would like to integrate the technology in the classrooms (Lumb et al, 2000; Monoghan, 2004:223).

Along with the fact that the majority of the instructors agree on the creative and innovative ideas which offer quality to education; yet the fact that they are not willing to apply these ideas in the

classrooms comes to the fore front as the obstacles before the development, alteration and quality (Eisenhart et al., 1993: 8); Kellogg and Kersaint, 2004).

2.7. Increasing the Quality of Mathematics Education and Capacities of Students

Some mathematical questions are asked to Turkish students (TİMSS, 1999). Considering the answers given to these questions; it can be seen that the qualities of the mathematical education provided to the students are lower than the qualities of the students in other countries. The mathematical questions which are asked to the questions are prepared with the direction from the idea of patterns and orders science of mathematics.

In accordance with the generally accepted perception; the basic purpose of mathematics education is thought to be performing mathematical operations (Putnam at al, 1990: 57), (Olkun and Toluk, 2001). There is no need for a pedagogic education in order to perform mathematical operations; the fact that mathematics education is regarded as equal to the performance of mathematical operations brings the domination of pedagogy and method information for those who work on pure mathematics into the agenda. The quality of mathematics education and the quality in the performance of mathematical operations emerge in direct proportion to how well the students and instructors know the methodology. The capacity of the students to use mathematics can be increased thanks to the interactive education with the new methods which can create a study environment for both students and instructors.

As long as performing mathematical operations or learning it is a kind of pattern search and arrangement; then it is necessary to arrange all the course activities accordingly. The students should have the course in a really practical way. The development of the skills such as making generalizations, pattern searches and information arrangement should be extended over a period of long time. The instructors should guide the students by preparing proper activities. If the subject learning is based on these principles, the development of these skills of students can be accelerated. Moreover, the skills of students to solve problems can also be improved. Because of the fact that the students form their own mathematical knowledge, it will be more convenient for them to come up with the solutions to the new and different problem situations thanks to the fact that they understand the relalational links better.

3. RESEARCH OBJECTIVE

Even though there are recent academic researches in order to increase the quality of service in higher education institutions, it is not possible to say that these are sufficient. It is observed in these studies that the service quality offering in higher education institutions is examined in a wholistic frame (education quality, social opportunities, inner and outer environment components etc). But this research is for determination of the expectations of the students from instructors and the importance level of the perceptions resulted from these expectations in order to provide a qualified university environment and education within the frame of a qualified academic and administrative personnel and a sophisticated student level.

3.1. Sample Method and Scale of Research

The sample of this research includes the students who are studying in different faculties and higher educations of Adıyaman University. The study is carried out in 2012-2013 academic year. It examines how much efficient the Mathematics Education Quality in Adıyaman University and the factors which affet this process. A scale including 32 questions is developed in accordance with the expectations of students related to instructors, school opportunities and mathematics education. The students are requested to evaluare these statements according to 5 point Likert scale (1-Very Weak, 2-Weak, 3-Sufficient, 4-Good, 5-Very Good). The volume of sample in the stuy is determined in the range of trust (%95) with a 5% error margin; the ideal sample volume which has the skill of presenting the universe is determined as 400. During the preparation of the poll, we benefit from the previous studies carried out in the related subject along with the focus group interview (Parasuraman et al. 1988; Erdoğan and Uşak, 2005; Saydan, 2008).

The parts of the poll form are discussed in general as;

- Demographic structure (belonging to students in department);

- University condition in department(physical conition and education program);
- Experience, knowledge and visions (of instructors in department);
- Wills and fears for courses (of students in department); and they become subjects.

The main group is comprised of the students of Adıyaman University. The total university student number in the year when the poll is conducted (in 2012) is 12.000. The sample volume for the poll is determined as 400 students and the poll is performed. During the prescreening, 84 survey forms belonging to the included working group were detected not to have been filled correctly and not included in the analysis stage. The reliability test of the poll is determined as 0.866 (Cronbach's Alpha value). This value offers that this poll is highly trustworthy.

3.2. Limitations of Research

There are limitations to be taken into consideration while evaluating the results of the research. The determined findings are the results related to the expectations by the students of Adıyaman University about the instructors and school opportunities. Therefore, it cannot be argued that the current findings state a general condition for other higher education institutions. In order to generalize the results, it is necessary to make a research which covers more universities and students who grow in different knowledge and cultures.

3.3. Findings of Research

Among the 314 students included in the research, 174 of them are female and 140 of them are male. 65 of them are freshmen, 125 of them are sophomore, 105 of them are junior and 20 of them are senior. 54 questions are asked within the scope of the research and 47 of them are evaluated in terms of determining the expectations of students and level of these expectations by using the definitional stattistic methods. The average and standard deviation value for each definition is shown in Tables 2-5.

- Demographic structure (belonging to students of departments)

Demographic Structure - (D1)

- Condition of university in departments (physical condition and education program)

Physical Condition - (O1)
Education Program - (O2)

- Experience, knowledge and visions (of the instructors in departments)

Experience - (T1)
Knowledge - (T2)
Vision- (T3)

- Will and fear for courses (of the students in departments)

Will – (S1)
Fear– (S2)

Table 2. Poll Data: Demographic Structure Belonging to Students

Num.	Question	Measurement	Acronym
1.	Age	Demographic	D1
2.	Gender	Demographic	D1
3.	Graduation	Demographic	D1
4.	Faculty	Demographic	D1
5.	City	Demographic	D1
6.	Higher Education	Demographic	D1
7.	Class	Demographic	D1

Table 3. Poll Data: Condition of University Physical Conditions and Education Program

Num.	Question	Measurement	Acronym
8.	School and its nearby meet my demand for the mathematics education.	Physical Conditions	O1
9.	Technological opportunities of school are sufficient for mathematics education.	Physical Conditions	O1
10.	Accomodation and dormitory facilities of the school are sufficient.	Physical Conditions	O1
11.	One can easily study in the compus environment.	Physical Conditions	O1
12.	Classrooms are sufficient, clean and proper for courses.	Physical Conditions	O1
13.	The equipments required for mathematics courses (tools, materials etc.) are avaliable.	Physical Conditions	O1
14.	The lighting, heating and cooling of the classrooms are sufficient and proper.	Physical Conditions	O1
15.	There are information services for making mathematics courses efficient.	Physical Conditions	O1
16.	The library resources are sufficient for mathematics researches.	Physical Conditions	O1
17.	The content of mathematics courses is sufficient.	Education Program	O2
18.	Mathematics course subjects meet my expectations.	Education Program	O2
19.	The different academic facilities of school (conferences, seminars etc.) are sufficient for making mathematics courses efficient.	Education Program	O2

Table 4. Poll Data: Experience, Knowledge and Visions of Instructors

Num.	Question	Measurement	Acronym
20.	Instructor is expert in the field of mathematics education.	Experience	T1
21.	He/She has the vocational knowledge and skill.	Experience	T1
22.	Instructor has guidance perception and knowledge of psychology.	Experience	T1
23.	Instructor encourages students for making research for the subjects which they like or are interested in.	Experience	T1
24.	Instructor encourages students for writing dissertation for finals about the subjects which they are interested in.	Experience	T1
25.	Instructor knows to measure and evaluate.	Experience	T1
26.	Instructors have relations with different (national/international) universities.	Knowledge	T2
27.	Instructor should use education technologies efficiently.	Knowledge	T2
28.	Instructor should use different methods and techniques.	Knowledge	T2
29.	Instructor has the sufficient general culture during mathematics courses for making relations with daily life.	Knowledge	T2
30.	Instructor should motivate by using mathematics enjoyably during courses.	Knowledge	T2
31.	Instructor should help and support the students for eliminating the problems while turning from concrete to abstract notions.	Knowledge	T2
32.	Instructor is open for alteration.	Visio	T3
33.	Instructor has an efficient communication skill and proper diction.	Vision	T3
34.	Instructor should teach course lively and willingly.	Vision	T3
35.	He/She should take care of students not only in courses.	Vision	T3
36.	Instructor gives student centered education.	Vision	T3
37.	Instructor has efficient time management skill.	Vision	T3
38.	Instructor is a role modal.	Vision	T3

Table 5. Poll Data: Wills and Fears of Students for Courses

Num.	Question	Measurement	Acronym
39.	Glad to be a member of school and own it in every condition.	Will	S1
40.	Mathematics is really fun for me.	Will	S1
41.	I am afraid of mathematics exams more than anything.	Will	S1
42.	I understand the mathematics course but when go home.	Will	S1
43.	I would like to have more mathematics courses	Will	S1
44.	I am not afriad of mathematics.	Will	S1
45.	Feel relieved after solving a mathematics problem.	Will	S1
46.	Speaking of mathematics, I think of complex and incomprehensible things.	Fear	S2
47.	Do not want to stand up in mathematics courses.	Fear	S2
48.	Worried about insructor's asking me questions in mathematics courses.	Fear	S2
49.	Understand mathematics now yet worried that it is getting harder.	Fear	S2
50.	I am afraid of asking questions in mathematics courses.	Fear	S2
51.	I am afraid of failing the class because of mathematics courses.	Fear	S2
52.	I feel uncomfortable in mathematics courses because of fear.	Fear	S2
53.	Do not know how to study for mathematics exams.	Fear	S2
54.	Always dream of being outside during mathematics courses.	Fear	S2

4. RESULTS OF THE ANALYSIS

4.1. According to Age

While the students participating in the poll are evaluated in terms of their ages, it is observed that there is no difference in their age range. The reason is that there is no significant difference among their ages.

4.2. According to Gender

Table 6. Physical Conditions – TP O1

Gender	Average	Participation	Standart Deviation
female	36,15	174	13,825
male	39,44	140	18,020
Total	37,62	314	15,891

It is found out that the female students in universities have different (more negative) opinions towards the physical conditions of the school from the male students. The female students find the physical conditions of the school insufficient.

4.3. According to Graduation

The high schools from which the students answering the poll graduated are mainly Regular, Vocational and Anatolian High Schools. The high schools other than these are gathered under the title of "other." Evaluating the school programs, it is seen that the Regular and Vocational High Schools have similar opinions; and they differ from Anatolian and other high schools. Moreover, Vocational and Anatolian High Schools have similarities. This indication means that the education quality and level in Regular and Vocational High Schools might be similar to each other. Therefore, it is the reason of their approach to mathematics education in universities. The approaches of the students who graduated from other high schools are totally different from those who graduated from Regular and Vocational High Schools. There is no common direction but they may have the same opinion with Anatolian High School and they can meet on a common line.

Table 7. According to the Cities where the Students Come from Test Statistics

	TP O1	TP O2	TP T1	TP T2	TP T3	TP S1	TP S2
Df	**10**	10	10	10	10	10	10
p	,258	,050	,228	,183	,002	,481	,422

When we evaluate the poll according to the cities where the students come from, the students state that they partially like the education programs offered in school and do not like the visions of the instructors. Compared in accordance with the cities; those who come from Adıyaman and Mersin differ from those who come from Urfa.

4.4. According to Faculty

For the comparison of more than 2 different groups, OneWay Anova Test is performed.

Table 8. Test Statistics (a, b)

	TP O1	TP O2	TP T1	TP T2	TP T3	TP S1	TP S2
Df	6	6	6	6	6	6	6
p	,178	,003	,004	,160	,001	,000	,021

a) Kruskal Wallis Test

b) Grouping Variable: Faculty

Evaluated in terms of Faculty and Higher Education; it is determined that the wills and fears of the students related to mathematics courses do not have any relation to the opportunities of the school or knowledge level of the instructor; yet, they include big differences with the program offered by the school, experience and visionary of the instructor. Along with it, it can be found out that this difference is resulted from the fear of mathematics; yet, the willingness is more than the fear.

When we compare the approaches of the Faculties and Higher Educations towards mathematics education; we observe that the biggest significant difference occurs among EAS and the faculties and higher educations other than EAS, and these differences are two-sided and mutual with positive and negative values.

- Basing on this generalization, the approach of the students towards mathematics education program (O2) is negative only between EAS and Science/Literature Faculty. The faculty of Science/Literature has more intense mathematics education program than EAS.
- On the other hand, evaluated in terms of the experience of instructor (T1); the approach of the students in EAS differs in a negative way compared to Education, Science/Literature and other higher educations. The students of EAS have negative statements towards the experience of instructor (T1).
- Under the light of statistical data, it can be stated that the vision of instructor (T3) differs in among the faculties and this difference is resulted from the fact that the students in EAS and the students in Education and other faculties have different approaches. While the approaches of the students in EAS are negative, the approached of those in Education and other faculties are positive.
- It is obvious that the willingness of the students (S1) in EAS for mathematics courses are different from the willingness level of those in Science/Literature and Education Faculty and this difference states that the students in EAS are more willing for the mathematics courses. Because it is observed that the comparison between EAS and Science/Literature and Education Faculties is positive.

4.5. According to Class

Table 9. Test Statistics (a, b)

	TP O1	TP O2	TP T1	TP T2	TP T3	TP S1	TP S2
Df	3	3	3	3	3	3	3
p	,553	,005	,113	,154	,023	,365	,116

a) Kruskal Wallis Test **b)** Grouping Variable: Class

Table1 0. Anova

		df	F	p
TP O2	Between Groups	3	4,462	,004
	Within Groups	307		
	Total	310		
TP T3	Between Groups	3	3,429	,017
	Within Groups	307		
	Total	310		

- When the poll is examined based on classes; there is a significant difference in the titles of mathematics education program (O2) and vision of instructor (T3).
- In mathematics education program (O2), the freshmen and juniors have more intense lectures than sophomores. Juniors think for the vision of instructor (T3) more positive than sophomores.

Table 11. Anova (b)

Model		df	F	p
1	Regression	3	34,221	,000(a)
	Residual	308		
	Total	311		

a) Predictors: (Constant), TP T3, TP T1, TP T2; b) Dependent Variable: TP O1

Table 12. Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	22,093	1,729		12,781	,000
	TP T1	,229	,066	,289	3,475	,001
	TP T2	,190	,077	,236	2,474	,014
	TP T3	,003	,069	,004	,048	,962

a) Dependent Variable: TP O1

Table 13. Anova (b)

Model		df	F	p
1	Regression	3	58,051	,000(a)
	Residual	308		
	Total	311		

a) Predictors: (Constant), TP T3, TP T1, TP T2 b)Dependent Variable: TP O2

Table 14. Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	11,547	2,122		5,442	,000
	TP T1	,539	,081	,511	6,656	,000
	TP T2	-,042	,095	-,039	-,440	,660
	TP T3	,156	,085	,151	1,831	,068

a) Dependent Variable: TP O2

As a general result is anticipated from the research, no multiple correlation results are written.

5. DISCUSSIONS AND CONCLUSIONS

Even though the students of economic and administrative sciences faculty (EAS) have less intense mathematics education program (O2), it is evaluated that they are more willing (S1) for mathematics courses, their approach to vision of instructor (T3) is negative and they have negative opinions for experience of instructor (T1).

Even though the students of Science/Literature faculty have more intense mathematics education program (O2), it is evaluated that they are less willing (S1) for mathematics courses and they have a notr

(neither positive nor negative) approach to vision of instructor (T3). Stating that they have a positive opinion for experience of instructor (T1), they think that the instructors are experienced individuals.

The students of education faculty do not declare a positive or negative statement about mathematics education program (O2). Even though there is mathematics course in education faculty, the willingness of students towards mathematics courses (S1) is negative. Despite this fact, in terms of willingness, the students of Education Faculty are more willing than those of Science/Literature Faculty. The students have positive statements towards the thoughts for vision of instructor (T3) and experience of instructor (T1).

In short; while making evaluations about mathematics education quality, the students of EAS, Science/Literature, Education and other Faculties have negative/positive statements depending on several factors and as a result of the analysis performed, the most positive statement related to mathematics education quality is made by the students of Education Faculty, the most negative statement is made by the students of EAS.

Consequently; the expectations of the students in higher education are important in terms of optimization and development of the education quality in universities. In order to meet the demands of the students and to offer services which can go beyond the expectations, it is necessary to meet the needs of the students. The students are the driving forces for increasing the service quality. Suggestions, demands, complaints and expectations of the students are highly important data for educational institutions.

Student satisfaction is the evaluation of the offered educational services by the students in terms of how much it meets the demands and expectations of students or the perceptions related to how much it exceeds the expectations. The other factor which comprises of the education quality is the student satisfaction. The education service offering is only possible by creating the student satisfaction after meeting the wills, demands, needs and expectations of the students and going beyond the expectations.

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