

## SEQUENCE ANALYSIS OF THE UNIVERSITY STUDENTS' CHOICE OF PROVINCES IN THE AEGEAN REGION USING ANALYTIC HIERARCHY PROCESS METHOD

Mustafa SOBA<sup>1</sup>

### ABSTRACT

In the situations in which it is hard to make a choice, decision can be made by using Analytical Hierarchy Process (AHP), one of the multi- criteria decision making methods. AHP is method used in solving the complex problems, in which the importance level of criteria shows variation. In order to make the best choice among the alternatives AHP method can also be used. In this study, the students in Aegean region who will see a four year undergraduate education in town for them to choose the most appropriate this decision-making technique was applied.

Prepared university students from the provinces in the Aegean region to facilitate choice, by using Analitic Hierarchy Process, firstly found degrees of importance to appraisal criteria, and then using the weighted scores the order of choice of the provinces in the Aegean region were established. At the end of application Izmir becomes in the rank of first by 15.80%. The other provinces in order of preference were as Manisa, Mugla, Denizli, Aydin, Kutahya, Usak, Afyonkarahisar.

*Key Words: AHP, Multi- criteria desicion making, University Selection Criteria*

## ANALİTİK HİYERARŞİ SÜRECİ YÖNTEMİ İLE EGE BÖLGESİNDEKİ ÜNİVERSİTE ÖĞRENCİLERİNİN İLLERE GÖRE SEÇİM SIRALAMASI ANALİZİ

### ÖZET

Seçim yapmanın kolay olmadığı durumlarda çok kriterli karar verme yöntemlerinden biri olan Analitik Hiyerarşi Süreci kullanılarak karar verilebilir. Analitik Hiyerarşi Süreci birden fazla kriterin ve kriterlerin önem düzeylerinin farklı olduğu karmaşık problemlerin çözümünde kullanılan çok kriterli bir karar verme yöntemidir. Alternatifler arasında en

---

<sup>1</sup> Assistant Prof. Dr., Usak University, Faculty of Economics and Administration, Department of Business, 64200, Usak, Turkey, mustafa.soba@usak.edu.tr

iyi seçimi yapabilmek için Analitik Hiyerarşi Süreci Metodundan faydalanılmaktadır. Öğrencilerinde dört yıllık öğrenim görecekları en uygun şehiri seçebilmeleri için karar verme tekniğine başvurulmuştur.

Üniversiteye hazırlanan öğrencilerin, Ege Bölgesinde bulunan iller arasında tercihini kolaylaştırabilmek için birçok seçim arasında karar verme tekniğı olan Analitik Hiyerarşi metoduyla, öncelikle değerlendirme kriterlerinin önem dereceleri bulunmuş, sonra ise ağırlık puanlarından yararlanılarak Ege Bölgesinde bulunan illerin tercih sırası gerçekleştirilmiştir. Uygulama sonunda %15.80'lik bir oranla İzmir ili gelmektedir. Tercih sırasına göre diğer iller; Manisa, Muğla, Denizli, Aydın, Kütahya, Uşak, Afyon illeri olarak sıralanmıştır.

## I INTRODUCTION

Universities where the information based on science is produced, developed and are one of the top education institutions in which the individuals to use these informations are brought up. Universities lead to reveal the new concepts by scientific and applicable researches (Comission Report,1996:106). The young have a quite importance as they take turn the future. They have to get an economic power in order to have a say in public. Thus they have to be a qualified, informed and skilled person as possible as they can be. They can meet the so-called requirements by taking a good university education. But in our country, as many of the universities revise themselves continuously, the young have a difficulty in making a choice. So they have to consider lots of criteria in university preferences.

Evaluating these criteria by using AHP and making university preference will be easier for the young. AHP is quite effective method in making such a decision. There are several studies as to AHP. The subjects are choosing tourism place (Manap,2006), determining of the factors affecting the traffic accidents (Uyar et,2003), shopping center selection (Tektaş and Hortaçsu, 2003), lecture selection (Dündar,2008) and Turkish naval forces submarines (Palaz and Kovancı,2008).

In this study, the provinces in Aegan region are appied. In determining the preferences of the young, AHP was used and some suggestions were made.

The most effective ten criteria have been determined while selected university by face- to- face negotiations with 60 students studying at universities in Usak and Afyonkarahisar and the survey has been applied. The sample of the research consists of 450 students studying at universities located on Afyonkarahisar, Aydın, Denizli, İzmir, Kutahya, Manisa, Mugla, Usak. The students made the survey have answered the questions by

considering preferred provinces where the universities locate in. As a result of the Research, the provinces have been ranked in according to effected criteria in Aegean region.

## II THE CRITERIA IN CHOOSING THE UNIVERSITIES

The universities having an important role in technological and Research- development systems also directly contribute to economic growth and development. The so- called benefits of universities are development of human resources, examining the economic politics in detail, shepherding for economic growth and transferring the knowledges they have (Zengingönül,1993;17).

Students give importance to education for making better future planning, earnings their economic freedom. So the young have a view that having a good future depends on studying at a good university. There are some criteria affecting the students' choice. These are as follows:

- Familial reasons
- Demographic and geographic reasons
- Social life in province
- Transportation
- Exam results
- Economic factors
- Level of Education
- Academic reasons
- Job opportunities
- Other factors

Based on these criteria students would like to facilitate the choices but most of the time degrees of importance of criteria varies from person to person. For this reason, the mean weight of the criteria was calculated by decision makers at first, then, criteria according to the provinces are evaluated by students.

## III MATERIAL AND METHOD

Decision-Making criteria plays an important role to make the most appropriate choice from the options. In one-criteria problems, in general, a problem is encountered as only one choice is available. However, the problems encountered today includes more than one criteria and contradict each other, so this situatin makes selection difficult (Zionts, 1979;94-101).

There is no need for the historical data in the application of Analytic Hierarchy Process. It consists of simple and straightforward numerical

procedures. It contains subjective assessments which is difficult to digitize and provides easier by decision makers' assessments. The difference compared to other methods AHP is followed in every steps by the decision makers, and can better understand evaluate and adopt the results because it can reflect subjective evaluation to the method (Tektaş and Hortaçsu, 2003;53).

AHP is one of the multi- criteria decision making methods used in a wide field and developed by Thomas L. Saaty in 1977. The most important advantage of this method is easy managing of multi- criteria decisions (Başlıgil,2005;25). AHP is a numerical method evaluating the quantitative and qualitative parametres and considering the priorities of individuals or groups in making decision (Dağdeviren et.,2004;132).

AHP 's main advantage is to be easy and can be achieved in this regard that the method is created (Lee, Kwak et,1995;345).

The way to be followed is as follows (Bhushan and Rai,2004;15):

- Step 1: Generating the hierarchical structure
- Step 2: Determining the priorities
- Step 3: Paired comparison matrix
- Step 4: Primacy vector
- Step 5: Calculating the consistency rate

#### **Step 1: Generating the Hierarchical structure**

In this step, the cause and effect relationship of complex decision making problems is explained and distinguished in linear chain form. It allows for the researchers to understand the problem. The aim of generating a hierarchical structure is determining the contributions of lower-level elements to top-level elements or the effect lower-level elements to top-level elements (Saaty,1994;94).

#### **Step 2: Determining the Priorities**

After generating the hierarchical structure, in order to compare all options among themselves, paired comparison decision form is designed. In genereting these forms, 1-9 importance scala suggested by Saaty is given below in table 1 (Kuruüzüm and Atsan,2001;83-105; Büyükyazıcı and Sucu,2003).

Table 1: The Basic Scala Used in Analytical Hierarchy Process (Saaty, 1980)

Significance Level	Description	Explanaition
1	Equal important	Both of the options have an equal importance
3	Adequate important	Experiement and judgement show the one factor superior according to the other factor
5	Strongly important	Experiement and judgement show the one factor superior according to the other factor
7	Too strongly important	One factor is considered superior According to other factor
9	Certainly important	The proof showing that one factor has a superiority against the other factor has a very huge reliability.
2, 4, 6, 8	Intergraduated values	The values between the two sequential factors used when compromising is required.

### Step 3: Paired Comparison Matrix

AHP, which deals with the priorities of groups and individuals and evaluates the qualitative and quantitive parametres together, is a method providing to have an idea about each factor without considering the other factors and to compare the factors in hierarchy by dealing in twos. In comparison matrix, the important step of AHP; the lines and columns are compared in terms of the so- called criteria, the answer of how important the factor in line is according to the factor in column is showed by denominated the numbers included in table 1. Paired comparison matrix is obtained by proportioning the weights given to the factors or  $w_i$  and  $w_j$  sizes as in table 2 (Özdamar,2004;38).

Table 2: Comparison Matrix of Criteria (Saaty,1980)

	Criteria-1	Criteria-2	Criteria ...	Criteria-n
Criteria-1	W1/W1	W1/W2	....	W1/Wn
Criteria-2	W2/w1	W2/w2	...	W2/Wn
Criteria ...	...	...	...	...
Criteria-n	Wn/W1	Wn/W2	...	Wn/Wn

### Step 4: Priority Vector

Priority vector is an important concept used in generating the priorities form paired comparison matrix in decision process. Priority vector of the so-called alternatives is obtained from paired comparison matrix. These vectors are multiplied with the weights of criteria included in the further step (Yılmaz,2000;34).

**Step 5: Calculating the Consistency Rate**

Consistency, an important subject in terms of fairness of the decision to be made, is a qualitative relationship of the values occurred as a result of paired comparisons (Saaty, 1980;21).

In order that the matrix becomes consistent, the highest value of matrix must be equal to n. The more inconsistencies in matrix appear, the more  $\lambda_{max}$  goes far from n. But  $\lambda_{max}$  is always higher than n,  $\lambda_{max} \geq n$  (Saaty and Vargas,2001;9, Yilmaz,2000;34). Consistency matrix is mathematical expression of consistency concept and is developed by Saaty in order to measure the consistencies of comparison conditions (Saaty,1980;21).

$$\text{Consistency indicator} = \lambda_{max} - n / n - 1$$

$$\text{Consistency proportion} = \text{Consistency indicator} / \text{Random Indicator}$$

If the consistency proportion is smaller than 0.1, the matrix becomes consistent. As a result of the investigations made, random indicators for the matrixes in 1- 15 size are calculated in table- 3. As seen in the table 3, random indicator can be found. The excess of criterions in the problems makes obtaining consistent result weak when all criterions considered together (Kwiesielewicz and Uden,2004;713-714).

Table 3: Random Index Numbers (Kwiesielewicz and Uden,2004)

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Random indicator	0	0	0,58	0,9	1,12	1,24	1,32	1,41	1,45	1,49	1,51	1,48	1,56	1,57	1,59

At the last step of AHP, decision maker can determine the best alternative by ranking the alternatives with the results.

**IV APPLICATION**

The students preparing for university exam have a difficulty in selecting the universities. They often have different ideas from their families. In order to prevent these problems in the Aegean Region of the students prefer to reason that the provinces where the criteria applied to determining the surveys. Having calculatated weighted of these criteria the degree of importance of criteria was found. As a result of sorting process was carried out surveys in terms of averages values.

In the study, AHP is used to determine sequence choice in Agean for students preparing for universities. Criterions in terms of survey done are shown in Table 4 as follow:

Table 4: The Quantitative Values of Provinces as to Criterion

<b>CRITERIA</b>	<b>Afyon</b>	<b>Aydın</b>	<b>Denizli</b>	<b>İzmir</b>	<b>Kütahya</b>	<b>Manisa</b>	<b>Muğla</b>	<b>Uşak</b>
Familial Reasons	3,10	2,52	2,80	2,74	2,08	2,50	2,48	2,34
Demog. and geogr. reasons	2,12	3,41	3,30	4,38	2,18	3,88	3,36	2,38
Social life in province	1,82	2,46	3,48	4,42	2,46	3,88	3,38	2,16
Transportation factor	2,46	2,58	3,02	4,22	2,86	3,02	3,48	2,74
Exam result factor	3,86	3,72	3,90	3,40	3,60	3,76	3,64	3,72
Economic reasons	2,06	2,39	3,32	3,44	2,62	2,24	3,46	2,72
Education level	1,78	2,75	3,12	4,54	2,50	3,84	3,44	2,08
Academic reasons	1,84	2,51	2,68	4,04	2,56	2,96	3,18	2,20
Job opportunity	1,80	2,36	3,16	4,40	2,54	3,00	3,18	2,34
Other factors	3,14	3,55	3,48	3,24	3,96	3,30	3,30	3,36

The values given in table-4 are generated by the average of the answers the students have given. Exam result factor seems to be the most important among criteria.

Table 5: Familiar Reasons Criteria

<b>PROVINCES</b>	<b>AVERAGE</b>	<b>NORMALIZATION STATUS OF AVERAGE</b>
AFYON	3,10	0,1508
AYDIN	2,52	0,1226
DENİZLİ	2,80	0,1362
İZMİR	2,74	0,1333
KUTAHYA	2,08	0,1012
MANİSA	2,50	0,1216
MUGLA	2,48	0,1206
USAK	2,34	0,1138
<b>TOTAL</b>	<b>20,56</b>	<b>1</b>

The young often consider their families' willings in their university selection. According to the values in table 5; Afyonkarahisar has been one of the provinces mostly selected. The reason of this situation may be the fact that student's families filling the survey live in Afyonkarahisar or that the families living in the east of Afyonkarahisar are close to Afyonkarahisar.

Table 6: Demographic and Geographic Reasons Criteria

PROVINCES	AVERAGE	NORMALIZATION STATUS OF AVERAGE
AFYON	2,12	0,0848
AYDIN	3,41	0,1363
DENIZLI	3,30	0,1319
IZMIR	4,38	0,1751
KUTAHYA	2,18	0,0872
MANISA	3,88	0,1551
MUGLA	3,36	0,1343
USAK	2,38	0,0952
<b>TOTAL</b>	<b>25,01</b>	<b>1</b>

Because the fact that the difference between winter and summer degree average is little, that it is close to sea, that the population planning is reasonable, paired relations and people, the students studying in Izmir consider this criteria more important than the students studying in other provinces.

Table 7: Social Life Criteria in Province

PROVINCES	AVERAGE	NORMALIZATION STATUS OF AVERAGE
AFYON	1,82	0,0756
AYDIN	2,46	0,1022
DENIZLI	3,48	0,1446
IZMIR	4,42	0,1837
KUTAHYA	2,46	0,1022
MANISA	3,88	0,1613
MUGLA	3,38	0,1405
USAK	2,16	0,0898
<b>TOPLAM</b>	<b>24,06</b>	<b>1</b>

Being more available the culturel background in Izmir may cause social activities increase. Criteria might have been that Izmir is preferred by students because there are much more universities and Non Government Organizations in Izmir than other provinces.

Table 8: Transportation Criteria

PROVINCES	AVERAGE	NORMALIZATION STATUS OF AVERAGE
AFYON	2,46	0,1009
AYDIN	2,58	0,1058
DENIZLI	3,02	0,1239
IZMIR	4,22	0,1731
KUTAHYA	2,86	0,1173
MANISA	3,02	0,1239
MUGLA	3,48	0,1427
USAK	2,74	0,1124
<b>TOTAL</b>	<b>24,38</b>	<b>1</b>



The fact that Izmir is a big city and it has several advantages such as airway, motorway and sea to way. So this fact eases the transportation. It has been an important respect in selecting Izmir. Even if Afyonkarahisar is located on easier geography in the country, it is the least selected province.

Table 9: Exam Result Criteria

PROVINCES	AVERAGE	NORMALIZATION STATUS OF AVERAGE
AFYON	3,86	0,1328
AYDIN	3,72	0,1280
DENIZLI	3,90	0,1342
IZMIR	3,40	0,1170
KUTAHYA	3,60	0,1239
MANISA	3,76	0,1294
MUGLA	3,64	0,1252
USAK	3,72	0,1280
<b>TOPLAM</b>	<b>29,06</b>	<b>1</b>

One of the criteria university students have difficulty is exam result factor. According to the survey results, 450 students answered, the average of exam result factor is 3,7022 and it is superior than the other criteria. It is due to the fact that the students haven't taken the grade they want or that they make their preferences according to their grades. In table-9, it can be seen that students studying in Denizli selects the university in Denizli is because of the exam result factor.

Table 10: Economic reasons criteria

PROVINCES	AVERAGE	NORMALIZATION STATUS OF AVERAGE
AFYON	2,06	0,0926
AYDIN	2,39	0,1074
DENIZLI	3,32	0,1506
IZMIR	3,44	0,1546
KUTAHYA	2,62	0,1177
MANISA	2,24	0,1007
MUGLA	3,46	0,1555
USAK	2,72	0,1222
<b>TOTAL</b>	<b>22,25</b>	<b>1</b>

The reason of the fact that Mugla becomes first in ranking is the fact that students studying in there thinks that they may take more scholarship and financial aid.

Table 11: Education Level Criteria

PROVINCES	AVERAGE	NORMALIZATION STATUS OF AVERAGE
AFYON	1,78	0,0740
AYDIN	2,75	0,1143
DENIZLI	3,12	0,1297
IZMIR	4,54	0,1888
KUTAHYA	2,50	0,1039
MANISA	3,84	0,1597
MUGLA	3,44	0,1430
USAK	2,08	0,0865
<b>TOTAL</b>	<b>24,05</b>	<b>1</b>

The thought that informations and experiements students need in business life are obtained more easily in Izmir and the fact that learning places are convenient give Izmir prominence.

Table 12: Academic Reasons Criteria

PROVINCES	AVERAGE	NORMALIZATION STATUS OF AVERAGE
AFYON	1,84	0,0837
AYDIN	2,51	0,1142
DENIZLI	2,68	0,1220
IZMIR	4,04	0,1839
KUTAHYA	2,56	0,1165
MANISA	2,96	0,1347
MUGLA	3,18	0,1447
USAK	2,20	0,1001
<b>TOTAL</b>	<b>21,97</b>	<b>1</b>

As a result of the fact that student support services, career planning and master programs presented in Izmir are made more disciplined, the students studying in Izmir may be agree on this criteria.

Table 13: Job Opportunity Criteria

PROVINCES	AVERAGE	NORMALIZATION STATUS OF AVERAGE
AFYON	1,80	0,0790
AYDIN	2,36	0,1036
DENIZLI	3,16	0,1387
IZMIR	4,40	0,1931
KUTAHYA	2,54	0,1115
MANISA	3,00	0,1317
MUGLA	3,18	0,1396
USAK	2,34	0,1027
<b>TOTAL</b>	<b>22,78</b>	<b>1</b>

The students studying in Izmir think that they may benefit the job opportunities more easily after they graduate from the university. So this fact gives Izmir prominence.

Table 14: Other Factors Criteria

PROVINCES	AVERAGE	NORMALIZATION STATUS OF AVERAGE
AFYON	3,14	0,1149
AYDIN	3,55	0,1299
DENIZLI	3,48	0,1273
IZMIR	3,24	0,1185
KUTAHYA	3,96	0,1149
MANISA	3,30	0,1207
MUGLA	3,30	0,1207
USAK	3,36	0,1229
<b>TOTAL</b>	<b>27,33</b>	<b>1</b>

The students living in Kutahya have preferred this criteria with 3,96 average much more according to other provinces. The reason of this fact may be the thought that the students only take the degree may be Adequate after the graduation or the will that male students postpone military service.

Table 15: Comparasion Matrix of Criteria

CRITERIA	Familial reasons	Demog.and geographic	Social life	Transportation	Exam result	Economic reasons	Education level	Academic reasons	Job opportunity	Other factors
Familial reasons	1,0000	4,0000	2,0000	4,0000	0,3333	3,0000	0,3333	4,0000	1,0000	4,0000
Demog.and geographic	0,2500	1,0000	1,0000	1,0000	0,2000	0,5000	0,2000	0,3333	0,2000	0,2500
Social life	0,5000	1,0000	1,0000	3,0000	0,2000	0,5000	0,3333	0,3333	0,3333	4,0000
Transportation	0,2500	1,0000	0,3333	1,0000	0,2000	0,2500	0,1429	0,2500	0,2000	0,3333
Exam result	3,0000	5,0000	5,0000	5,0000	1,0000	4,0000	2,0000	2,0000	2,0000	3,0000
Economic reasons	0,3333	2,0000	2,0000	4,0000	0,2500	1,0000	0,2000	0,3333	0,3333	0,3333
Education level	3,0000	5,0000	3,0000	7,0000	0,5000	5,0000	1,0000	2,0000	2,0000	3,0000
Academic reasons	0,2500	3,0000	3,0000	4,0000	0,5000	3,0000	0,5000	1,0000	0,3333	0,3333
Job opportunity	1,0000	5,0000	3,0000	5,0000	0,5000	3,0000	0,5000	3,0000	1,0000	4,0000
Other factors	0,2500	4,0000	0,2500	3,0000	0,3333	3,0000	0,3333	3,0000	0,2500	1,0000

The criterias given in table 15 have been evaluated by comparing by the users. Then whether the matrix is consistent or not has been calculated. The consistency rate has been found as 0,0969 and there is no problem in consistency rate.

Table 16: Weighted Scores of Criteria

Criteria	Weighted scores
<b>Familial reasons</b>	0,1376
<b>Demog.and geographic</b>	0,0281
<b>Social life</b>	0,0604
<b>Transportation</b>	0,0223
<b>Exam result</b>	0,2112
<b>Economic reasons</b>	0,0481
<b>Education level</b>	0,1866
<b>Academic reasons</b>	0,0787
<b>Job opportunity</b>	0,1485
<b>Other factors</b>	0,0785

After the paired comparisons have been made, the weighted scores were founded and the final table has been prepared.

Table 17: The Final Table

	Famil Reason	Demog and Geo	Social Life	Transpo	Exam result	Econom reasons	Educ Level	Acaemi reason	Job opport	Other factors
Afyon	0,1508	0,0848	0,0756	0,1009	0,1328	0,0926	0,0740	0,0837	0,0790	0,1149
Aydin	0,1226	0,1363	0,1022	0,1058	0,1280	0,1074	0,1143	0,1142	0,1036	0,1299
Denizli	0,1362	0,1319	0,1446	0,1239	0,1342	0,1506	0,1297	0,1220	0,1387	0,1273
Izmir	0,1333	0,1751	0,1837	0,1731	0,1170	0,1546	0,1888	0,1839	0,1931	0,1185
Kutahya	0,1012	0,0872	0,1022	0,1173	0,1239	0,1177	0,1039	0,1165	0,1115	0,1149
Manisa	0,1216	0,1551	0,1613	0,1239	0,1294	0,1007	0,1597	0,1347	0,1317	0,1207
Mugla	0,1206	0,1343	0,1405	0,1427	0,1252	0,1555	0,1430	0,1447	0,1396	0,1207
Usak	0,1138	0,0952	0,0898	0,1124	0,1280	0,1222	0,0865	0,1001	0,1027	0,1229
Averages Weighted	<b>0,1376</b>	<b>0,0281</b>	<b>0,0604</b>	<b>0,0223</b>	<b>0,2112</b>	<b>0,0481</b>	<b>0,1866</b>	<b>0,0787</b>	<b>0,1485</b>	<b>0,0785</b>

Table 18: Province Ranking

THE RANK OF RELEVANCE	PROVINCES	RELEVANCE COEFFICIENT OF SELECTED PROVINCE IN UNIVERSITY SELECTION
1.	IZMIR	%15,80
2.	MANISA	%13,52
3.	MUGLA	%13,42
4.	DENIZLI	%13,39
5.	AYDIN	%11,73
6.	KUTAHYA	%11,11
7.	USAK	%10,81
8.	AFYON	%10,36

It is shown that the rank of relevance for Provinces according to the ten criteria is in the table 18. It is seen that Izmir becomes in the rank of first.

### CONCLUSION

AHP is a method used in answering the complex problems covering several criterias. AHP provides complex decision problems of expert opinions, the main aim of problem, criteria, sub- criteria and the relationship between the alternatives and sub- criteria. Also AHP is to become one of the methods frequently used in solving the desicion making problems.

Selecting a university is a long-term planning process for the candidate students and the student will draw a road map for himself/herself about the desicion he/she has taken. So he/she will maintain his/her social-economic life during his/her life. In this decision making process, the students and their families have a great responsibility and because of these responsibilities they have to make a selection by considering several criteria.

There should be several criterias increasing the life quality in a university city for he/ she will spend at least four years and energy. These may be; familial reasons, demographic and geographic reasons, social life, transportation, exam result, education level, academic reasons, job opportunity and other factors. All of these criteria have been analyzed in AHP, the most preferred city has become Izmir by 15,80 percent among all the universities in Aegean region. The fact that Manisa is too close to Izmir may be a factor in becoming the second province in ranking. Coast Aegean Regions are much more preferred than internal Aegon Regions. The fact that all the universities in the provinces except Izmir are founded in 1992, Usak university, founded in 2006, has come to the front rank of Afyon Kocatepe university in preference point. It is possible to develop this study in other work by adding some more criteria. AHP can also be applied to all over the universities selection in Turkey, it is known that every year more than 1,5 candidate students make great efforts to be undergraduate student. AHP can applied a kind of service and manufacturing sectors by emreging different

kind of criteria and can be compared to other multi criteria decision making methods at the same study.

### REFERENCES

- Başlıgil Hüseyin. (2005). "The Fuzzy Analytic Hierarchy Process For Software Selection Problems," *Yıldız Teknik Üniversitesi Mühendislik ve Fen Bilimleri Dergisi*, C.3.
- Büyük Yazıcı M., Sucu, M. (2003). "The Analytic Hierarchy and Analytic Network Processes," *Hacettepe Journal of Mathematics and Statistics*, Volume 32.
- Commission Report, (1994). Türkiye Üniversite-Sanayi İşbirliği Birinci Şurası, İTÜ Ayazağa Kampüsü, 4-5 Kasım 1994, s.39., Bilim, Teknoloji ve Üniversiteler, Başbakanlık Basımevi, Ankara
- Dağdeviren, Metin, Diyar Akay ve Mustafa Kurt. (2004) "İş Değerlendirme Sürecinde Analitik Hiyerarşi Prosesi ve Uygulaması," *Gazi Üniversitesi Mühendislik-Mimarlık Fakültesi Dergisi*, 19 (2), 131-138.
- Dündar, Süleyman. (2008). "Ders Seçiminde Analitik Hiyerarşi Prosesi Uygulaması," *Süleyman Demirel Üniversitesi İktisadi İdari Bilimler Fakültesi Dergisi*, Cilt: 13, Sayı: 2, 217-226
- Kuruüzüm, A. ve Atsan, N. (2001). "Analitik Hiyerarşi Yöntemi ve İşletmecilik Alanında Uygulamaları," *Akdeniz İ.İ.B.F Dergisi*(1), 83-105
- Kwiesielewicz, Mirosław, and Uden Ewa Van. (2004). "Inconsistent and Contradictory Judgements In Pairwise Comparison Method In The AHP," *Computers & Operations Research* 31
- Lee H., Kwak W. and Han I. (1995). "Developing a Business Performance Evaluation System: An Analytic Hierarchical Model," *The Engineering Economist*, 40 (4), 343-358.
- Manap, Gonca. (2006). "Analitik Hiyerarşi Yaklaşımı ile Turizm Merkezi Seçimi," *Ticaret ve Turizm Eğitim Fakültesi Dergisi*, Sayı: 2, 157-170.

- Navneet, Bhushan, and Rai Kanwal. (2004). "Strategic Decision Making Applying The Analytic Hierarchy Process," Springer, America, 15.
- Özdamar, D.Y. (2004). "Analitik Hiyerarşi Süreci Yöntemi: Bir Satın Alma İhalesinde Uygulanması," *Yüksek Lisans Tezi, Ankara Üniversitesi Sosyal Bilimler Enstitüsü*.
- Palaz, Hakan, ve Kovancı, Ahmet. (2008). "Türk Deniz Kuvvetleri Denizaltılarının Seçiminin AHP ile Değerlendirilmesi," *Havacılık ve Uzay Teknolojileri Dergisi, Cilt: 3, Sayı: 3, 53-60*
- Saaty Thomas L., (1980). *The Analytical Hierarchy Process*, Mc Grow-Hill Company, New York.
- Saaty, Thomas, L., (1994). "Fundamentals of Decision Making and Priority Theory with Analytic Hierarchy Process," *RWS Publications, Pittsburg*.
- Saaty, T.L., and Vargas, L. G. (2001). "Models, Methods, Concept and Applications of The Analytic Hierarchy Process," *Kluwer Academic Publishers, London*.
- Tektaş, Arzu, ve Hortaçsu, Ayfer. (2003). "Karar Vermede Etkinliği Arttıran Bir Yöntem: Analitik Hiyerarşi Süreci ve Mağaza Seçimine Uygulanması," *İktisat, İşletme ve Finans Dergisi Cilt:18, Sayı:209, 52-61*
- Uyar, Yavuz, Kurt, Mustafa, ve Dizdar, Ercüment, N., (2003). "Trafik Kazalarını Etkileyen Faktörlerin AHP Yaklaşımı ile Görelî Önemlerinin Belirlenmesi," *Teknoloji, Cilt:6, Sayı: 1-2, 63-68*
- Yılmaz, N. (2000), "Analitik Hiyerarşi Yaklaşımı," *Yüksek Lisans Tezi, Yıldız Teknik Üniversitesi Fen Bilimleri Enstitüsü*.
- Zengingönül, Oğul. (1993). Avrupa Topluluğu Comett Programı Çerçevesinde Üniversite-Sanayi İşbirliği," *TOBB Yayın No Genel: 271*.
- Zionts, Stanley. (1979). "Multi Criterai Desicion Making- If not a Roman Numeral Then What? Interfaces, v.9, n.4, pp. 94-101