ÇUKUROVA UNIVERSITY
INSTITUTE OF NATURAL AND APPLIED SCIENCES

MSc THESIS

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MEASUREMENT AND EVALUATION SYSTEMS IN SOME SELECTED TURKISH HIGHER EDUCATION UNIVERSITIES

DEPARTMENT OF STATISTICS

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INSTITUTE OF NATURAL AND APPLIED SCIENCES

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DEPARTMENT of ISTATISTICS

We certify that the thesis titled above was reviewed and approved for the award of degree of the Master of Science by the board of jury on / /2016

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ABSTRACT

MSC THESIS

MEASUREMENT AND EVALUATION SYSTEMS IN SOME SELECTED TURKISH HIGHER EDUCATION UNIVERSITIES

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Absolute and relative evaluation systems of Turkish universities are used. Relative evaluation and the related regulations are presented. In this evaluation system, some differences are implemented. In this study, differences between evaluation systems of 10 different Turkish universities and 5 different courses in Çukurova University were focused. The normality tests for course scores and the evaluated scores are tested . Furthermore, HEC' transformation table was used and it was compared with the results of hundred point scale in our study. According to the results, Çukurova University evaluation system is the best equivalent.

Then the researcher analized the data in the area of Microsoft office Excel 2007 and Spss 15.0 package. According to the relative evaluation regulations of the selected universities the data was calculated in Excel. Furthermore, the results, found in the area of Excel, were analized in the area of Spss to run Descriptive statistics, Normality tests, and histograms. The results are illustrated in data sets.

İn the normality tests, we found that most of the "**Sig.**" Values are greater than .05 . Therefore, our variables are normallydistributed except few variables.

Key words: Absolute grading system, Relative grading system, Raw success score, Relative evaluation participation limits-score, Relative evaluation regulation.

ÖZ

YÜKSEK LİSANS TEZİ

TÜRKİYE'DE SEÇİLMİŞ BAZI ÜNİVERSİTELERİN ÖLÇME VE DEĞERLENDİRME SİSTEMLERİ

Hassan Abdullahı HASSAN

ÇUKUROVA ÜNİVERSİTESİ
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Türkiye'deki üniversitelerde mutlak değerlendirme ve bağıl değerlendirme sistemleri kullanılmaktadır. Her Üniversitenin değerlendirme sistemi ile ilgili yönergesi bulunmaktadır. Bu değerlendirme sistemleri bazı farkılıklarla uygulanmaktadır. Bu çalışmada, Türkiye'deki 10 farklı üniversitenin değerlendirme sistemleri ve Çukurova üniversitesinde verilen 5 farklı dersin notları ele alınarak bu farklılıklar üzerinde durulmuştur. Ders notların ve değerlendirmeye alınan notlar normallik uyum tesi uygulanmıştır. Ayrıca, Yök'ün dönüşüm tablosu kullanılmış. Çalışmada ele alınan üniversitenin yüzlük not sistemindeki değerlendirmelerle karşılaştırılmıştır. Elde edilen sonuçlara göre genelde Yök'ün dönüşüm tablosundaki değerlendirmeye daha uygun değerlendirme sonuçlarının Çukurova Üniversitesi'ndeki değerlendirme sistemi olduğu görülmüştür.

Veri Microsoft Excel 2007 ve SPSS 15.0 programları kullanılarak analiz edilmiştir. Seçilmiş üniversitelerdeki bağıl değerlendirme yönergelerine göre veri Excel kullanılarak değerledirme yapılmıştır . Sonrasında, Excel'de bulunan sonuçlar Spss programında Tanımlayıcı İstatistikler, Normallik Testleri ve Histogram grafikleri gibi araçlar kullanılarak analiz edilmiştir. Sonuçları veri setlerinde gösterilmiştir.

Normallik testlerinde, çoğu anlamlılık değeri 0,05'ten daha büyük olarak elde edilmiştir. Bu nedenle, birkaç değişken haricinde değişkenlerimizin dağılımı normal dağılım göstermektedir.

Anahtar Kelimeler: Mutlak değerlendirme sistemi, Bağıl değerlendirme sistemi, Ham başarı puanı, Bağıl değerlendirme katılım alt sınır, Bağıl değerlendirme yönerges

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LIST OF ABBREVİATİONS

C1	: MT261 (A course in Mathematics Department)
C2	: ISB363 (A course in Statistics Department)
C3	: ISB221 (A course in Statistics Department)
C4	: ENM244 (A course in Industrial Engineering)
C5	: ISB421 (A course in Statistics Department)
AES	: Absolute Evaluation System
RES	: Relative Evaluation System
REPL	: Relativel Evaluation Participation Limit
HGL	: HighestGradingLetter.
HEC	: Higher Education Council
A	: Çukurova University
B	: İstanbul University
C	: Ege University
D	:Adıyaman University
E	:Artvin University
F	: İnönü University
G	:Niğde University
H	:Ankara University
I	: Istanbul Medipol University
J	:Istanbul Esenyurt University

1. INTRODUCTION

This Study investigates measurement and evaluation systems in some selected Turkish higher education universities. For centuries, measurement and evaluation systems became one of the difficult and controversy topics among the scholars in education.

In Turkey, most higher education institutes use the grading system of AA, BA, BB, CB, CC, DC, DD, FD, and FF. the meaning of these letters differ from university to another. Getting a grade like BA or CB adds or subtracts a few tenths of a point. In general, we use two types of grading systems. In this evaluation system, some differences are implemented.

Absolute grading: each point is assigned a letter grade. In this system it is possible for all students to pass or fail. If the students score 90 and above, then all students get AA in this test.

Relative grading: grades are given based on the student's score compared to the others in the class. In this system a few students are guaranteed to get AA and a few students are guaranteed to receive an FF.

(Travers&Gronlond, 1950) early studies showed that the main reason behind recording marks in a school is to provide a record of the student's accomplishment. In educational institutions the meaning of each mark must be specified. Furthermore, sometimes marks are unreliable. For example, if a student received a mark "C" in a group of higher ability is compared to another student who received the same mark in a group of lower ability, agreement could not be expected. The expectations of teachers from students are different. For example, marking an examination in mathematics, one teacher might consider the extent to which the student used a correct method for solving the problems, regardless of whether the answers to the questions were correct, while another teacher might score only for the correctness of the answer.

Absolute and relative evaluation systems of Turkish universities are used. Relative evaluation and the related regulations are presented. In this evaluation system, some differences are implemented. In this study, differences between

evaluation systems of 10 different Turkish universities and 5 different courses in Çukurova University were focused.

In chapter 2,concepts and definitions related to measurement and evaluation systems were presented.

In chapter 3, we discussed not only how the data was gathered, but also the material and the method used .

In chapter 4, the researcher highlights the research findings and discussion of the study which conducted secondary data which is based on the students' scores of 5 different courses: C1, C2, C3, C4, C5. A major findings were found and this section summarized the main findings of the thesis with regard to the research objectives. Then the results were compared.

2. LITERATURE REVIEW

2.1. Measurement, Evaluatıon Concepts And Gradıng Systems

2.1.1. Measurement.

Measurement is defined as,“the process of assigning numbers to individuals or their characteristics according to specified rules” (Ebel & Frisbie, 1991). William and Irvin (1991), Stated that measurement is a wider idea, in addition, characteristics can be measured by using observationsinstead of tests.

2.1.2. Evaluation

Evaluation is defined as “ a statement of quality, goodness, merit, value, or worthiness about what has been assessed.”(james R morrow etal 2005). According to Throndike(1997), indicated that evaluation can be stated as extracting meaning from measuring objects in order to reach a good decision.

It is necessary to mention that we do not measure or evaluate students but we measure and evaluate characteristics of the students: their ability to read, knowledge of geometry, achievement in a test. However, some instructors evaluate personalities, rather than performance of the student in the class. Students who achieved the expected objectives of the course must get the highest marks and marks must be based on meaningful things. Because marks measure the level of accomplishment of the specific objectives of education. In other words, the amount of useful learning is directly proportional to the marks he or she receives .Mehrens&Lehman(1991).

2.1.3. Grading Systems

In Turkey, most higher education institutes use the grading system of AA, BA, BB, CB, CC, DC, DD, FD, and FF. the meaning of these letters differ from

university to another. Getting a grade like BA or CB adds or subtracts a few tenths of a point.

(Starch & Elliott, 1913) investigated the reliability of work in history. They studied the variability of values placed by teachers on examination papers. Identical copies of questions and the answer paper were given to two hundred high schools with the request that that every teacher grade student paper according to the standards and the passing grade of the school. The result showed wide variability in the scores assigned by teachers. He suggested that the variability of the marks is a function of the examiner. Finally, he recommended adoption by all schools of some uniform marking system. Moreover, teachers must use a detailed key answer showing how each particular step is assigned.

According to (Madsen, 1931) on many occasions it was suggested that examinations and marking systems are disagreeable and may result confusion results. Marking essay tests are controversy because the teachers marking the same pupil's paper may give the pupil an A, while the other teacher gives him an F. so, some lecturers on the platform argued that examination and marking should be abolished. In many scientific studies it is mentioned that examinations are useful in both determining a pupil's achievement status and making reports to parents. Finally, he suggested to reduce the essay tests because the more objective the exam, the more accurate the results.

(Bixer, 1939) identified that dissatisfaction with marking systems had increased. As a result, most of the schools had changed their marking systems. In addition, marking low marks brings grief, shame, jealousy, or other undesirable emotional attitudes to the students that will result dislike of learning and early withdrawals from schools. Factors, like, efforts made by the pupil, successful performance in examination, attention and interest in class work, and self-reliance of pupil affect teachers' marks. Success is important to all students. However, a survey made on some public schools shows that most students with higher mental ability success in school.

(Travers&Gronlond, 1950) early studies showed that the main reason behind recording marks in a school is to provide a record of the student's accomplishment.

In educational institutions the meaning of each mark must be specified. Furthermore, sometimes marks are unreliable. For example, if a student received a mark “C” in a group of higher ability is compared to another student who received the same mark in a group of lower ability, agreement could not be expected. The expectations of teachers from students are different. For example, marking an examination in mathematics, one teacher might consider the extent to which the student used a correct method for solving the problems, regardless of whether the answers to the questions were correct, while another teacher might score only for the correctness of the answer.

Measurement and evaluation systems were discussed by many scholars and researchers for long time, but in 1969 when Benson published his conference paper entitled “Graduate grading systems” and indicated that 53% of the graduate schools used two grade points other than five grade points in part or in whole, many researchers started to study marking systems. The use of the two grade points encouraged the students to study for knowledge not for grades. In addition, this system research grades have no effects on the academic grade point. In general, the grade point given to the student indicates the level of knowledge expected from the student.

According to the report on grading at the university of California(1970), the university had been using two grade point system plus written evaluations of the student’s performance since it established 1965. Because during the late 1960’s the use of pass-fail grading system enjoyed large popularity. Some non introductory under graduate courses were letter graded. Unfortunately, some graduate schools argued that the process of evaluating Santa Cruz transcript was morecomplex and difficult than letter grading.

Ebel,(1974) examined marking systems and their effects on student attitude, he suggested that every system has positive and negative aspects and insisted that the reliability of mark increases as the number of categories increase. One of the key issues in different marking systems is that they can not report student’s performance more accurately; the most successful student in low ability class may be considered as only averaged in another class of higher ability. From one point of view it’s

unreasonable situation to give an “A” for the valedictorian student in a group and exactly the same achievement in the other group would have received a mark of “C”.

Malone etal,(2000) presented the idea of using plus/minus system of grading to replace the old A through F grading system. In any grading system, the one who is giving the grades deals with the opinion that in one particular system, for example traditional system, he or she might have high possibilities for mistake, but the mistake, if occurred, the effect will be less. Conversely, Pass/Fail grading system, he or she might have fewer possibilities for error, but if an error were made, it would have much more impact. He suggested that plus/minus grading system have more opportunities to evaluate student’s performance fairly and correctly and can distinguish the sharp differences among the students than the traditional system.

Hohner and Tsigaris,(2010) the rationale behind using different grading systems is that philosophy and practice of countries are not same. However, he examined the alignment of two grading systems and it is implications on the grade distribution. A Canadianuniversity has trouble with evaluating Students’ transcripts who comeback to Canada after attaining higher degrees in many scientific fields.The present practice of the Canadian university is to take away five marks from all final marks sent by the universities from outside Canada. It was better to discover an appropriate exchange rate from one grading system to another.Moreover,the study assumes that international students in Canada have difficulties with the language of instruction. As a result, mostly are academic underachievers and they need more support from the institute. Furthermore, the study showed that thelanguage proficiency of the student has a major impact on the student’s achievement.

Carl Rom, (2011) explored the ways for grading a student’s performance in a school activity more accurately. A good marking system assigns grades that correctly reflect a student’s performance. Most educators and experts believe that students’ performance and abilities are normally distributed and their grades are distributed on the curve. As the result many students will gradually get near to the grading cut points, and because of the small differences across students are likely to be little concerned about their grades given the emotional and consequential differences between, say, a C+ and B- or B+ and A- , so this process will influence badly

student's access to scholarships, awards, advanced education, and employment. Mostly, professors take care about the marks they give to the students and try to assign the exact grade to each student. Conversely, few professors are neither serious about grading schemes nor devote same time and attention to each student. Moreover they like to satisfy students in order to minimize complaints.

Al quraan,(2012) examined the assessment methods to evaluate students in higher education in the colleges and universities of Jordan. He investigated the influences of university and marking system on the judgment methods used for grading students' performance. Achievement assessment in most areas of study in colleges is complex. For assessing students, most professors use different methods of evaluation; homework, class participation, projects. Besides that, he argued that traditional paper-pencil test is the common method which college members use for assessing their students. Furthermore, he mentioned that a single mark can not be used to evaluate student's work more accurately.

2.2. Necessary Requırements For Measurement Tools

Educators use examinations as a measurement tool for measuring different characteristics. As we are aware of, random error may interrupt our decision making, however, researchers and experts in education advise using high-quality data for our decision. Technically speaking, data must be reliable. In daily live, if a person says true, keeps promise and honest, he is reliable. Likewise, reliability in measurement tools increase as random errors decrease.

In this section we will discuss two important concepts reliability and validity.

2.2.1. Reliability

Reliability can be defined as the degree of consistency between two measures of the same thing. In other words, the reliability coefficient for a set of scores from a group of examinees is the coefficient of correlation between that set of scores and

another set of scores on an equivalent test obtained independently from members of the same group.

In every test the observed score is the combination of the true score and the error score.

$$X = T + E \tag{2.1}$$

Students' scores vary if the scorer's attention, while reading test papers, is not good. However, fatigue, health, and concentration of the student can affect the validity of the scores.(Ebel & Frisbie , 1991,p 77-78).

The researcher categorized estimates of reliability as follows ;(Morrow etal, 2005,P 88-89)

2.2.1.1. Test-Retest Estimate

In this method classroom teachers give a test to the same group of students and give the same test to the same group of students at later date, and then they correlate the two sets of scores obtained in the different tests.

2.2.1.2. Measures of Equivalence

In this procedure educators give two forms with equal content (similar but different questions) to the same group of students on the same time and then they correlate the two sets of scores.

2.2.1.3. Split-Half Estimates

In this procedure a single test is administered the same group of students. After that, in estimating reliability, the test is divided in to two equivalent forms and these two sub-scores are correlated using Spearman-Brown prophecy formula

$$r_{xx} = \frac{2r_{1/2}^{1/2}}{1+r_{1/2}^{1/2}} \quad (2.2)$$

Factors that can increase reliability:

- Test length in general, reliability increases with the number of items in a test.
- Clear and concise statements must be used. Moreover, questions, that are very easy that all students can answer or, conversely, very difficulty that all students get wrong answers, are not advisable.
- Duration of the test is considered as neither short nor long. A good test is one in which every examinee has time to try all questions in the test.
- Group homogeneity is another important factor, reliability will be higher when a test is given to a heterogeneous group.
- Objectivity of the test may reduce the random error due to the scorer.
- Instruction, in general, in a test paper number of questions, duration of the test, mark of every item, and other important information must be mentioned. (Mehrens& Lehmann, 1991, p. 258-259).

2.2.2. Validity

Validity isdefined as the extent to which any measuring instrument measures what it is intended to measure. In general, validity can be categorized as content validity, criterion-related validity, and construct validity. (Edward and Richard, 1979. P. 17).

2.2.2.1. Content Validity

The purpose of most test administrators is to make an inference about student's performance in the future. So, test constructors must consider in detail the

interested topics and the behaviors the test is designed to sample. In achievement tests, test constructors try to measure the ability, knowledge and other behaviors of the student. In addition, if a test constructor measures other behavior which was not intended to measure, decreases the content validity of the test. For example, classroom teacher wants to know the ability of arithmetical operations, but considers the poor hand writing of the student.(William and Irvin, 1991, p. 266-267).

2.2.2.2. Criterion-Related Validity

A criterion measure is an accepted standard relating to the investigating the relationship between two measures. In general criterion-related validity is divided as fallows;

- Predictive validity: this type of measure is concerned with predicting student's performance in future; for example, high school exit exams and grade-point average of the students canpredict their future performance.
- Concurrent validity: the main difference between predictive validity and the concurrent validity is the time period. Concurrent evidence would be useful to show that students appear in the same relative rank order on the two measures. When we compare the grade-point average of the student to his/or her ÖSS scores is a good example for concurrent validity. (Ebel&Frisbie , 1991,p 106-108).

2.2.2.3. Construct Validity

Construct validity is a judgment about the appropriateness of inferences drawn from test scores regarding individual standings on a variable called a construct. Construct validity is widely used for psychological tests like intelligence, motivation and creativity. The researchers who are interested in investigating construct validity such as personality formulate hypothesis about the expected behavior, then, they develop a personality test. If the expected relationship is found,

then the construct validity of the appropriateness of inferences drawn from test scores is supported. Furthermore, homogeneity of the questions (in order to measure a single concept) and age are considered to be important.(Ronald and Marks, 2009, p. 193-195).

3. MATERIAL AND METHOD

The researcher presents the method he uses to do this research.

3.1. Data Collection

To do the analysis introduced above, the researcher gathered relative evaluation regulations from the 10 Turkish Universities' websites which are listed below. The researcher preferred to choose Universities in different regions of Turkey. The scope of our study consists of 10 Turkish Universities listed as follows:

Table 3.1. List of Universitiesandtheir web addresses

University	URL	Date visited
Çukurova University	http://www.cu.edu.tr/upload/yonetmelikler/Bagil%20Degerlendirme%20Yonergesi%20Son%20%C5%9Eekli_2015.pdf	26.01.2016
İstanbul University	http://www3.istanbul.edu.tr/oidb/mevzuatdosyalar/EsaslarKararlar/OnlisansLisans_Olcme_Degerlendirme_Esaslari.pdf	26.01.2016
Ege University	http://oidb.ege.edu.tr/demo/pd/yon/olcmedegerlendirme.pdf	26.01.2016
Adıyaman University	http://oidb.adiyaman.edu.tr/Files/oidb/Yonetmelik-Yonerge-Kanun_vb/BAGIL_DEGERLENDIRME_YONERGESI.pdf	26.01.2016
Artvin University	http://www.artvin.edu.tr/files/user_files/368/files/mevzuat/senato_26102011artvin_coruh_universitesi_bagil_degerlendirme_sistemi_yonergesi.pdf	26.01.2016
İnönü University	https://www.inonu.edu.tr/uploads/old/6/65/2013-bagil-degerlendirme-yonergesi.pdf	26.01.2016
Niğde University	http://medya.nigde.edu.tr/uniweb/media/portallar/oidb/sayfalar/2958/xyb0cqcl.pdf	26.01.2016
Ankara University	http://oidb.ankara.edu.tr/files/2014/01/Ba%C4%9F%C4%B1l-De%C4%9Ferlendirme.pdf	09.02.2016
Medipol University	https://kms.kaysis.gov.tr/Home/Goster/69274	10.02.2016
EsenYurt University	http://www.esenyurt.edu.tr/Upload/Editor/files/Ba%C4%9F%C4%B1l%20De%C4%9Ferlendirme%20Sistemi%20Uygulama%20Y%C3%B6nergesi.pdf	16.02.2016
HEC	http://www.yok.gov.tr/documents/10279/31737/4_luk_sistem_100/f3d72044-c756-4302-ab26-91af35f45f43	16.02.2016

To investigate the measurement and evaluation systems of some selected Turkish higher education Universities, the researcher gathered the data needed for the study as a secondary data which is based on the students' scores of 5 different courses: C1, C2, C3, C4, C5, from Çukurova University, in particular statistics department. According to the relative evaluation regulations, the researcher wanted to know the difference in the spread of marks if the scores obtained according to the relative evaluation regulations of Çukurova university are used according to relative evaluation of the other universities.

3.2. Material

The secondary data obtained from the statistics department was analized in the area of Microsoft office Excel 2007 and Spss 15.0 package.

3.3. Method

To build a grading and evaluation system, the researcher used the relative evaluation regulations.

3.3.1. Midterms and Final Examinations

For Istanbul university, The evaluation of both the midterms and final exams is contributed to the interval [0.5, 0.7] and Medipol is contributed to 0.3 and 0.7 for midterms and final exams respectively. The remaining eight universities raw success scores are calculated through 40% midterm activities and 60% of final exam.

3.3.2. The Calculation of Raw Success Score

The raw success score is calculated considering midterm and final exam scores.

For istanbul university

$$Raw\ success\ score = midterm\ score * 0.5 + final\ score * 0.5 \quad (3.1)$$

For medipol university

$$Raw\ success\ score = midterm\ score * 0.3 + final\ score * 0.7 \quad (3.2)$$

For the remaing universities

$$Raw\ success\ score = midterm\ score * 0.4 + final\ score * 0.6 \quad (3.3)$$

DZ is given to the students who can't fulfill the conditions related to attendance. Students having DZ grade and those who did not attend the final exam are excluded from the system and their grades are not evaluated while Raw Success Score is being calculated.

Consider the table below. İn Çukurova University FF is given to the student whose raw success score is below 35 and final score below 30. But the students' raw success score is taken into consideration in class average calculation. Same comments can be given to the remaing universities.

FF is given to the students whose scores are under the relative evaluation participation limit.. Students having FF grade is excluded from the system and their grades are not evaluated while Raw Success Score is being calculated.

Table 3.2. Summary of relative evaluation regulations

Terminologies	A	B	C	D	E	F	G	H	I	J
Midterm	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4
Final	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6
Relative Evaluation ParticipationThreshold(REPT)			15	20	15	15 - 25	10		20	20
Raw Success Score Threshold(RSST)	35	35	40	35	30	50 - 50	35			
Final NoteThreshold	30	40	45	35	35	45 - 55	35			40

İn most cases if the the number of students participating the ralative evaluation is 30 and above we use T-scores. Then a letter Grade is determined according to Regulation Score Table.

$$T = 10Z + 60 \tag{3.4}$$

$$Z = \frac{X - \bar{X}}{S} \tag{3.5}$$

X: Student’s scores

$\bar{x}$: Class average

S: Standard deviation of the class

4. RESEARCH FINDINGS AND DISCUSSION

This chapter highlights the research findings and discussion of the study which conducted secondary data which is based on the students' scores of 5 different courses: C1, C2, C3, C4, C5. A major findings were found and this section summarized the main findings of the thesis with regard to the research objectives.

Table 4.1. Spread of grade letters for the universities in C1 course

n=84	REP	HGL	AA	BA	BB	CB	CC	DC	DD	Passed	Type of grading
HEC	84	CC	0	0	0	0	2	12	24	38	AES
A	25	CC	0	0	0	0	1	6	11	18	AES
B	14	CB	0	0	0	1	4	3	6	14	AES
C	79	AA	2	5	5	7	1	0	0	20	RES
D	70	AA	2	5	3	8	2	0	0	20	RES
E	79	AA	2	5	5	7	6	0	0	25	RES
F	79	AA	4	2	1	0	0	0	0	7	RES
G	83	AA	2	5	6	6	1	0	0	20	RES
H	84	AA	0	1	2	4	7	12	11	37	AES
İ	69	AA	2	2	2	1	3	9	4	23	RES
J	70	AA	2	5	3	11	7	12	10	50	RES

This table summarizes the spread of marks in C1. If we consider Çukurova University, the highest grading letter is CC. Also, one student got CC, six students got DC and eleven students got DD. In general 18 students passed the course .Moreover, type of grading is Absolute. The comments for the remaining universities follows the same manner.

Table 4.2. Spread of grade letters for the universities in C2 course

n=53	REP	HGL	AA	BA	BB	CB	CC	DC	DD	Passed	Type of grading
HEC	53	AA	3	0	12	10	8	9	5	47	AES
A	44	AA	6	3	9	7	7	7	7	46	RES
B	45	AA	3	7	15	2	10	3	5	45	RES
C	47	AA	17	8	0	2	6	4	3	40	RES
D	49	AA	6	11	8	3	10	8	1	47	RES
E	50	AA	6	11	8	7	7	8	0	47	RES
F	45	AA	3	6	16	1	12	4	3	45	RES
G	51	AA	3	9	13	2	11	8	1	47	RES
H	36	AA	3	2	4	8	8	0	1	26	AES
İ	49	AA	6	6	7	6	0	4	6	35	RES
J	49	AA	6	11	8	3	10	2	0	40	RES

Table 4.3. Spread of grade letters for the universities in C3 course

n=89	REP	HGL	AA	BA	BB	CB	CC	DC	DD	Passed	Type of grading
HEC	89	AA	1	0	2	2	4	9	14	32	AES
A	22	AA	2	1	1	1	5	7	5	22	RES
B	19	AA	1	2	0	2	3	0	2	10	AES
C	22	AA	7	2	3	4	5	1	0	22	RES
D	22	AA	3	1	1	5	6	6	0	22	RES
E	53	AA	3	2	3	4	9	1	1	23	RES
F	53	AA	3	2	5	4	4	0	0	18	RES
G	61	AA	3	2	4	6	6	1	0	22	RES
H	69	AA	1	1	1	2	5	8	13	31	AES
İ	42	AA	3	0	1	1	1	4	4	14	RES
J	54	AA	3	1	1	5	6	9	8	33	RES

Table 4.4. Spread of gradeletters for the universities in C4 course

n=89	REP	HGL	AA	BA	BB	CB	CC	DC	DD	Passed	Type of grading
HEC	89	AA	1	0	1	14	15	15	10	56	AES
A	46	AA	2	1	6	10	11	12	4	46	RES
B	45	AA	4	7	9	8	8	4	2	42	RES
C	47	AA	9	9	6	6	9	5	3	47	RES
D	61	AA	2	5	11	8	13	4	3	46	RES
E	63	AA	2	5	12	9	12	4	6	50	RES
F	46	AA	2	5	13	10	12	1	0	43	RES
G	64	AA	2	5	12	11	10	4	2	46	RES
H	66	AA	1	0	0	2	5	8	4	20	AES
İ	59	AA	2	1	2	6	7	9	6	33	RES
J	61	AA	3	8	9	12	10	5	0	47	RES

Table 4.5. Spread of gradeletters for the universities in C5 course

n=148	REP	HGL	AA	BA	BB	CB	CC	DC	DD	Pased	Type of grading
HEC	148	AA	2	2	9	16	28	25	22	104	AES
A	95	AA	8	5	5	15	24	20	17	94	RES
B	97	AA	8	6	15	14	19	10	5	77	RES
C	91	AA	21	10	13	13	8	9	12	86	RES
D	119	AA	6	6	10	20	18	17	11	88	RES
E	128	AA	5	7	11	25	20	12	14	94	RES
F	86	AA	5	7	19	19	21	8	0	79	RES
G	130	AA	5	7	11	26	21	10	8	88	RES
H	138	AA	2	5	3	4	5	10	13	42	AES
İ	114	AA	7	3	5	9	6	18	8	56	RES
J	119	AA	11	8	20	18	20	20	1	98	RES

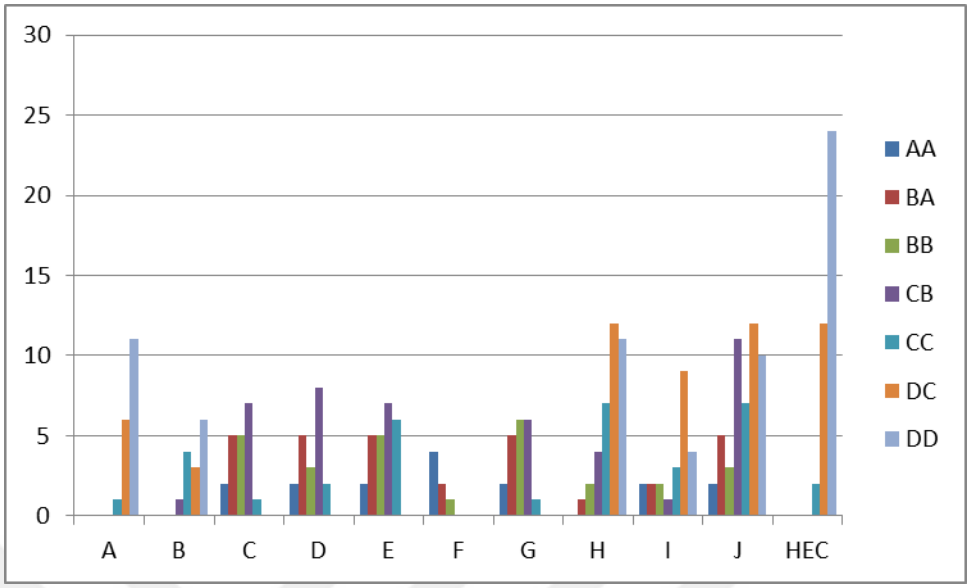

Figure **4.**1.This figure shows the distribution of letter grading for C1 course.

The X-axis is the universities and the Y-axis represents the frequencies of the grading letters. A university we have 3 grading letters; CC, DC, and DD. B university we have 4 grading letters; CB, CC, DC, and DD. C university we have 5 grading letters; AA, BA, BB, CB, and CC. D university we have 5 grading letters; AA, BA, BB, CB, and CC. E university we have 5 grading letters; AA, BA, BB, CB, and CC. F university we have 3 grading letters; AA, BA, and BB. G university we have 5 grading letters; AA, BA, BB, CB, and CC. H university we have 6 grading letters; BA, BB, CB, CC, DC, and DD. I university we have 7 grading letters; AA, BA, BB, CB, CC, DC, and DD. J university we have 7 grading letters; AA, BA, BB, CB, CC, DC, and DD.

The comments for the remaining figures follow the same logic.

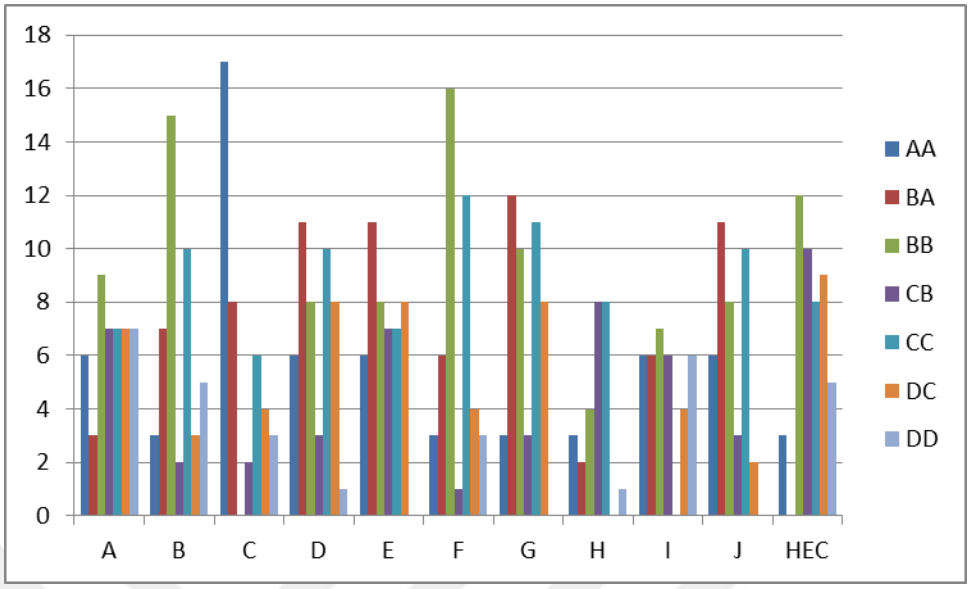

Figure **4.**2. This figure shows the distribution of letter grading for C2 course.

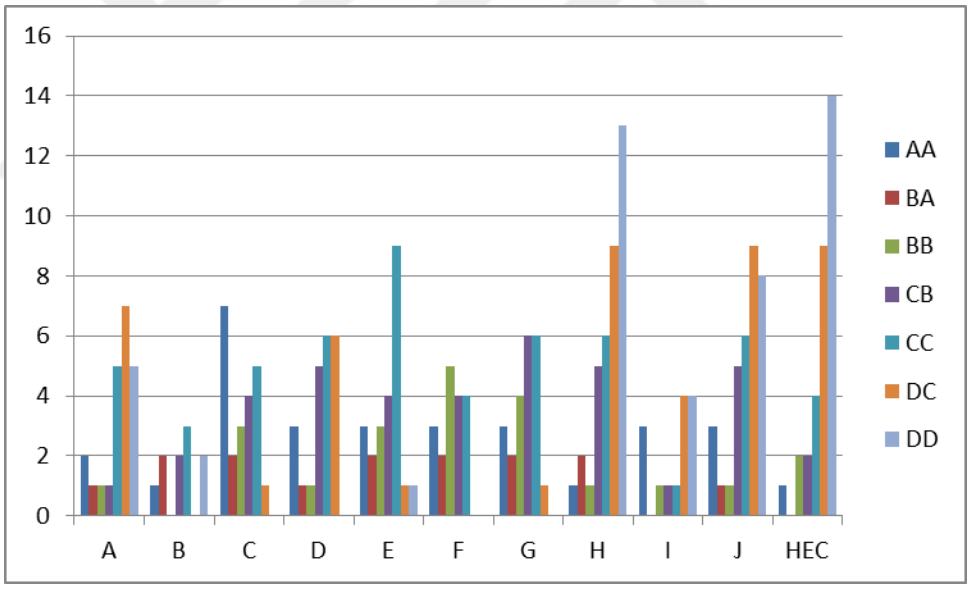

Figure **4.**3. This figure shows the distribution of letter grading for C3 course.

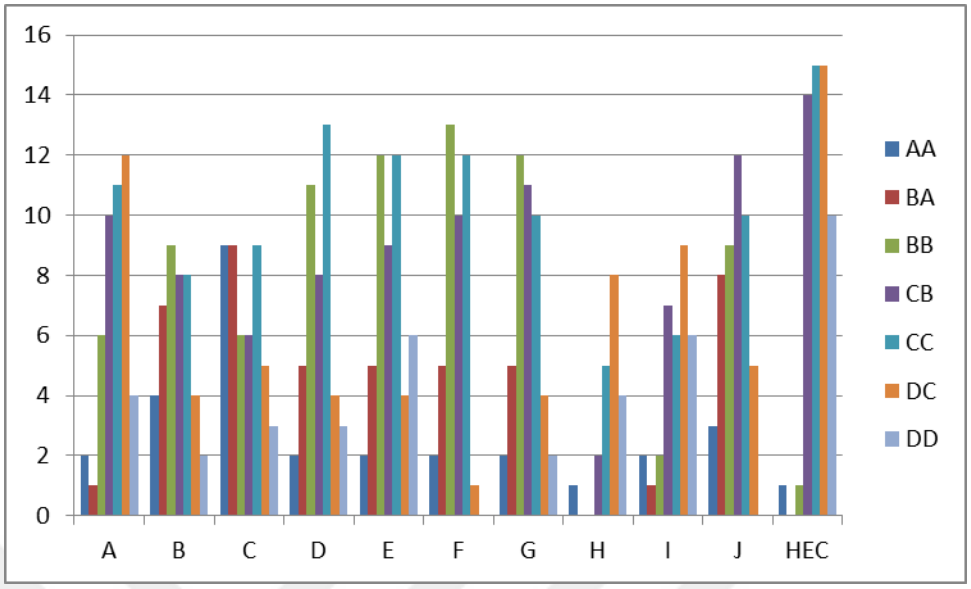

Figure **4.**4. This figure shows the distribution of letter grading for C4 course

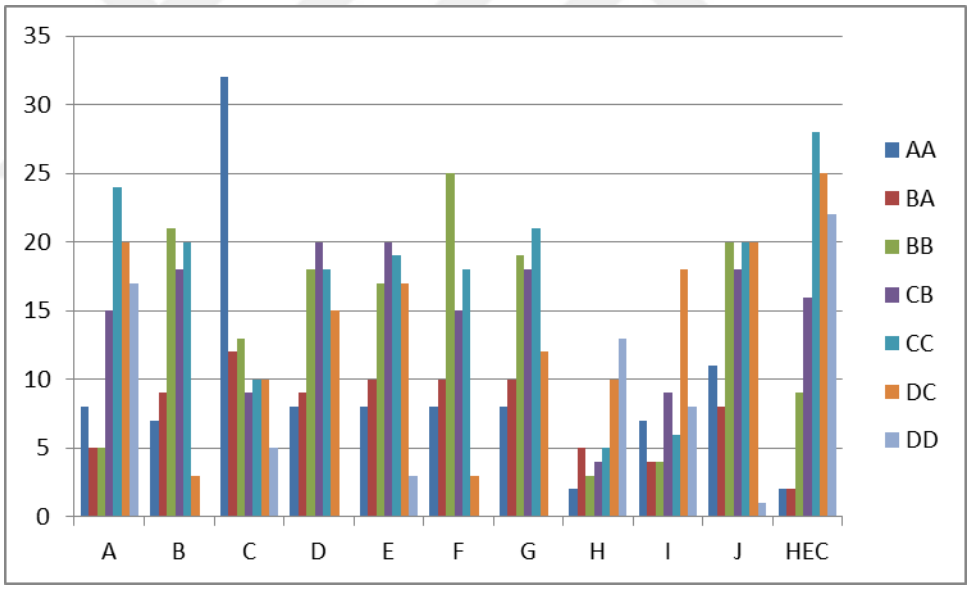

Figure **4.**5. This figure shows the distribution of letter grading for C5 course.

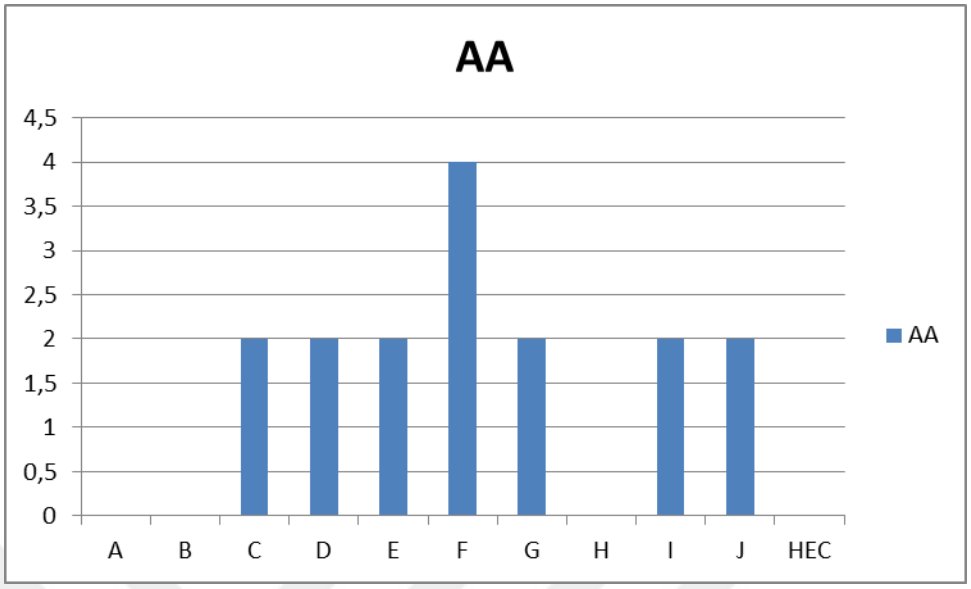

Figure **4.**6. This figure shows the distribution of AA for C1 course.

The X-axis represents universities and the Y-axis represents AA letter frequencies. A, B, and H universies no student obtained AA. C, D, E, G, I, and J universities two students got AA. F university four students got AA. The comments for the remaining figures follow the same logic.

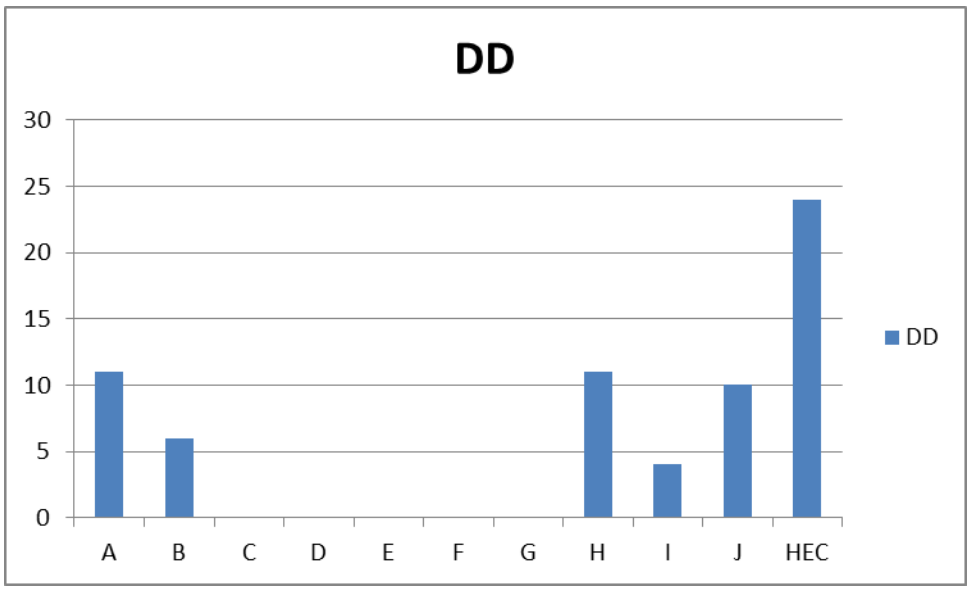

Figure **4.**7. This figure shows the distribution of DD for C1 course

The X-axis represents universities and the Y-axis represents DD frequencies. A university 11 students got DD. B university 6 students got DD. C, D, E, F, G universities no student got DD. H university 11 students got DD. I university 4 students got DD. J university 10 students got DD. The comments for the remaining figures follow the same logic

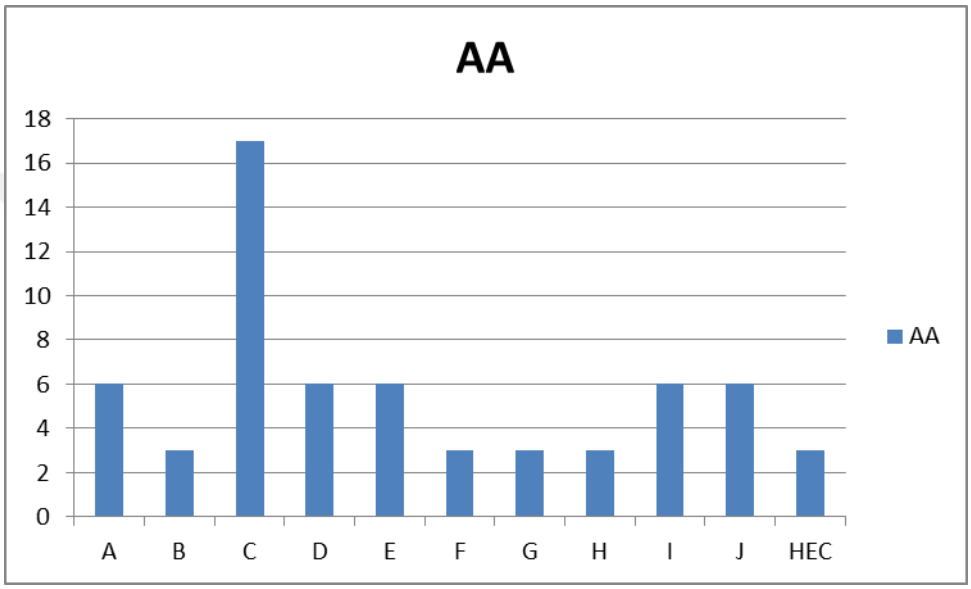

Figure **4.**8. This figure shows the distribution of AA for C2 course

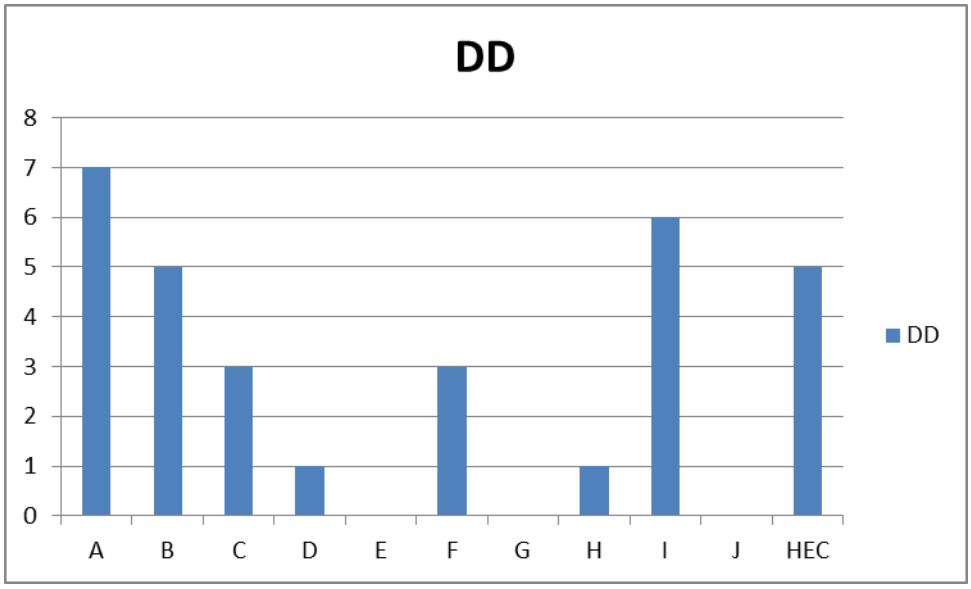

Figure **4.**9. This figure shows the distribution of DD for C2 course

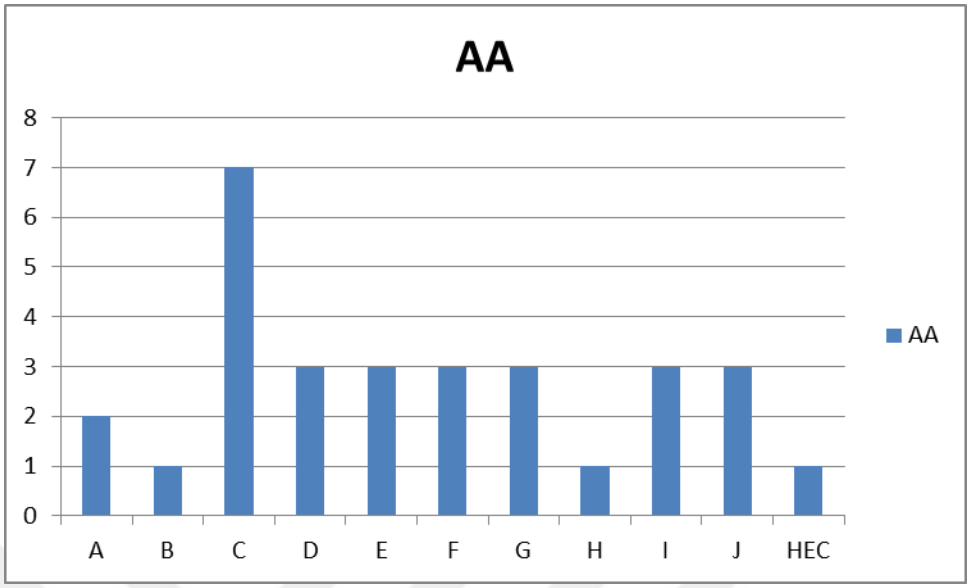

Figure **4.**10. This figure shows the distribution of AA for C3 course.

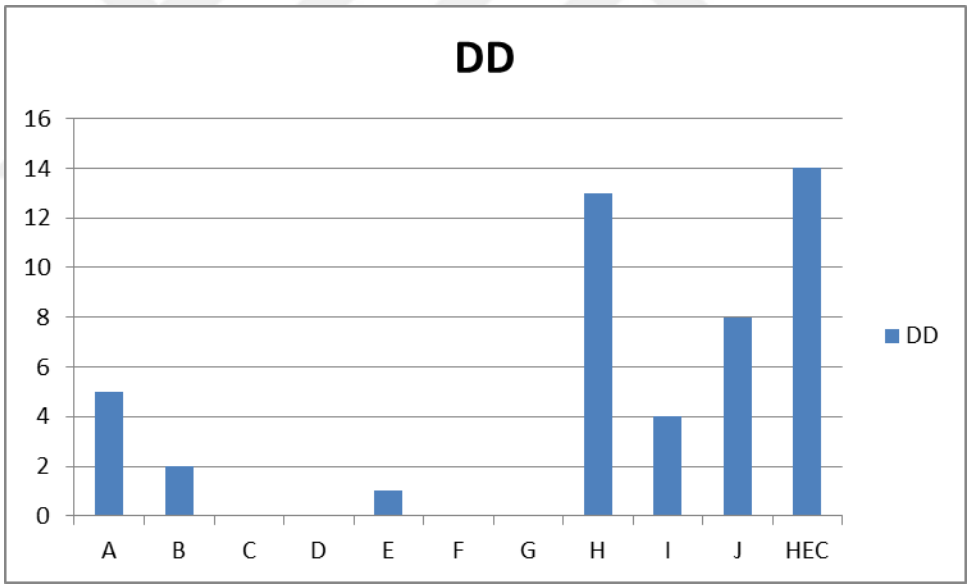

Figure **4.**11. This figure shows the distribution of DD for C3 course

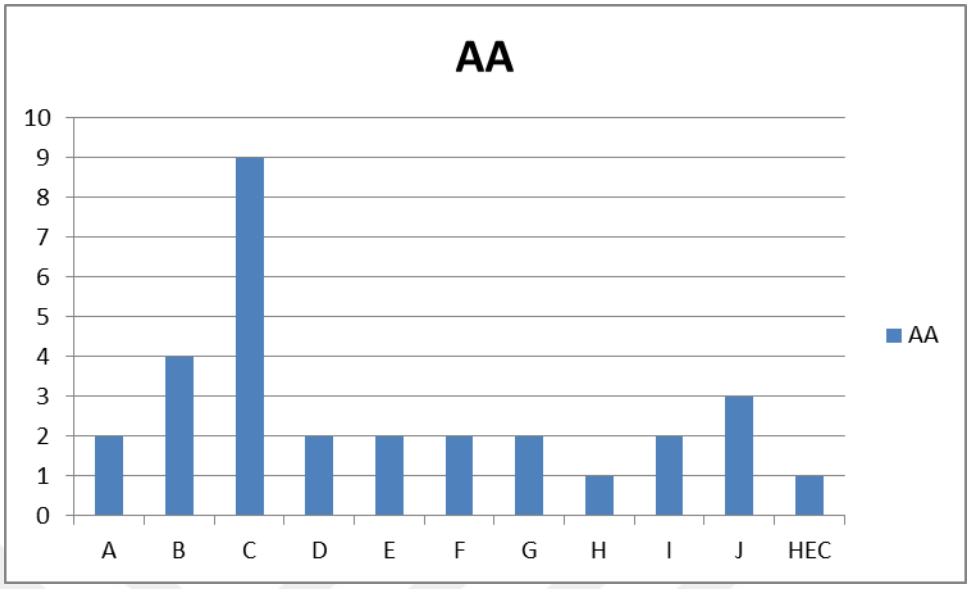

Figure **4.**12. This figure shows the distribution of AA for C4 course.

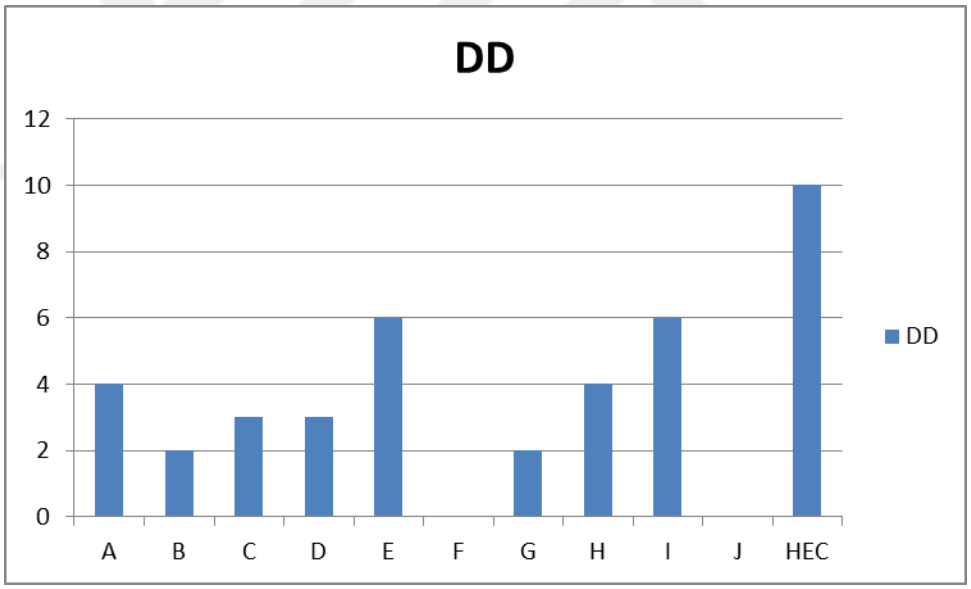

Figure **4.**13. This figure shows the distribution of DD for C4 course.

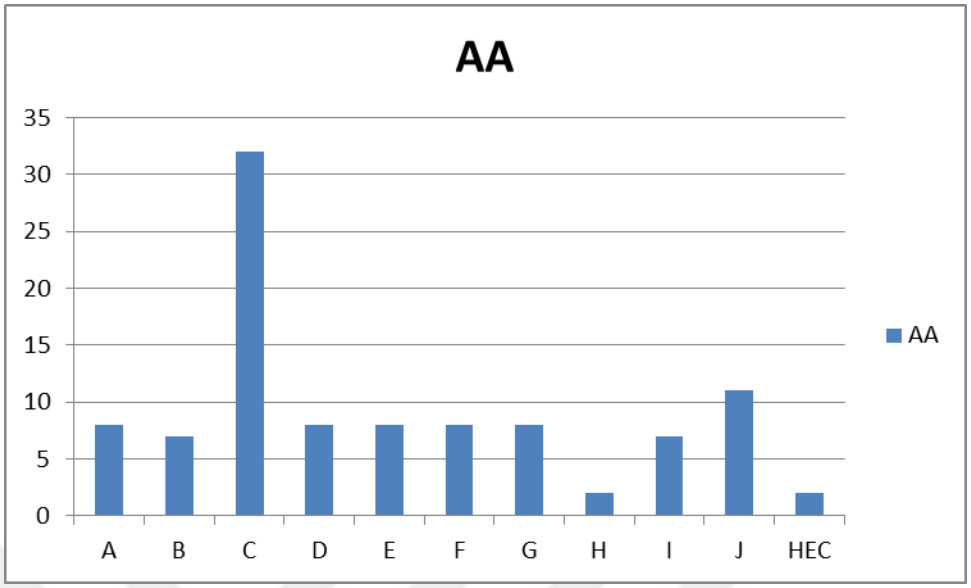

Figure **4.**14. This figure shows the distribution of AA for C5 course.

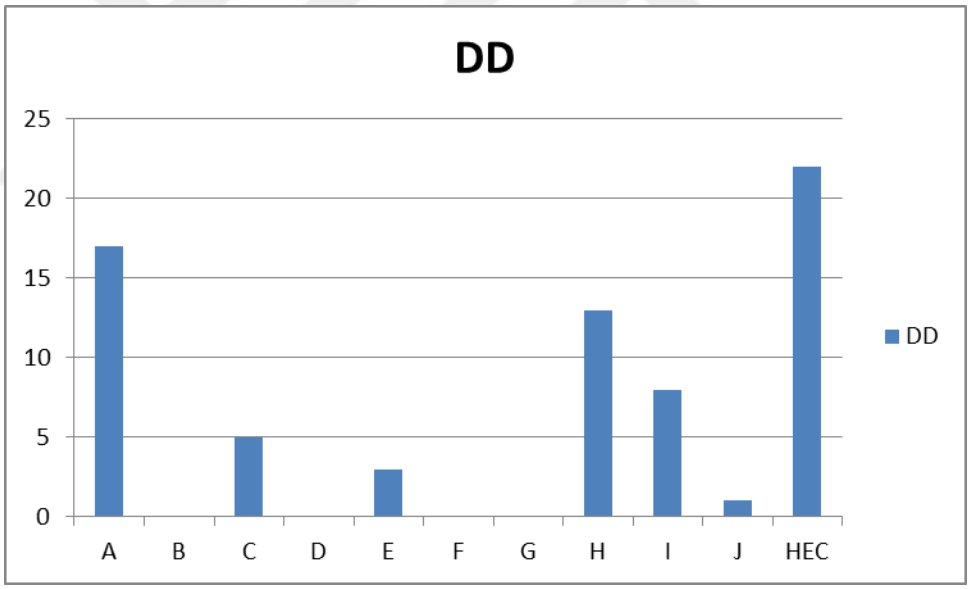

Figure **4.**15. This figure shows the distribution of DD for C5 course.

Table 4.6. Shows the comparison of letter grading limits (*t values used in the letter grades which are mapped to the equivalent mark border values on [0 , 100]) in C1 course

Limits	n=84	AA	BA	BB	CB	CC	DC	DD
	HEC	89.96	88.33	76.66	65	53.33	41.66	30
	Çukurova	90	82	73	65	57	48	40
	İstanbul	80	71	63	55	50	45	35
t	Ege	*81	76	71	66	61	56	51
		52.61	47.56	42.51	37.47	32.42	27.37	22.32
t	Adıyaman	*81	76	71	66	61	56	51
		52.70	48.06	43.43	38.79	34.15	29.52	24.88
t	Artvin	*81	76	71	66	61	56	51
		52.61	47.56	42.51	37.47	32.42	27.37	22.32
	İnönü	50.40	45.59	39.24	34.76	29.63	24.92	19.55
t	Niğde	*81	76	71	66	61	56	51
		52.72	47.44	42.16	36.89	31.61	26.33	21.06
	Ankara	62.61	57.22	51.83	46.44	41.06	35.67	30.28
t	Medipol	*81	78.5	76	73.5	71	66	63.5
		53.25	50.85	48.46	46.07	43.68	38.89	36.50
t	Esenyurt	*71	66	61	56	51	46	41
		52.70	48.06	43.43	38.79	34.15	29.52	24.88

If we consider the 3rd column, we observe that Çukurova university students can get AA with earning at least 90 marks. Istanbul university students can get AA with at least 80 marks. Ege university students can get AA with at least 52.61 (t=81). Adıyaman university students can get AA with at least 52.7 marks (t=81). Artvin students can get AA with at least 52.61 (t=81) . İnönü students can get AA with at least 50.4 marks. Niğde students can get AA with at least 52.72 marks (t=81). Ankara university students can get AA with at least 62.61 marks. Medipol university students can get AA with at leat 53.25 (t=81). finalyEsenyurt students can get AA

with at least 52.7 marks (t=71). The comments for the remaining columns follow the same logic.

Table 4.7. Shows the comparison of letter grading limits (*t values used in the letter grades which are mapped to the equivalent mark border values on [0 , 100]) in C2 course.

Limits	n=53	AA	BA	BB	CB	CC	DC	DD
	HEC	89.96	88.33	76.66	65	53.33	41.66	30
	Çukurova	84.23	79.25	73.25	66.23	54.74	45.99	38.26
	İstanbul	82.16	73.86	63.42	55.18	46.33	40.39	31.47
t	Ege	*71	66	61	56	51	46	41
		83.56	74.08	64.61	55.13	45.66	36.18	26.71
t	Adıyaman	*71	66	61	56	51	46	41
		83.46	74.44	65.43	56.42	47.41	38.40	29.39
t	Artvin	*71	66	61	56	51	46	41
		83.56	74.08	64.61	55.13	45.66	36.18	26.71
	İnönü	90.68	81.55	69.50	61.29	48.08	41.37	31.54
t	Niğde	*73	68	63	58	53	48	43
		87.72	77.72	67.73	57.74	47.74	37.75	27.76
	Ankara	90	85	80	75	70	65	60
t	Medipol	*71	68.5	66	63.5	61	56	53.5
		87.39	82.86	78.32	73.78	69.23	60.15	55.61
t	Esenyurt	*61	56	51	46	41	36	31
		83.46	74.44	65.43	56.42	47.41	38.40	29.39

Table 4.8. Shows the comparison of letter grading limits (*t values used in the letter grades which are mapped to the equivalent mark border values on [0 , 100]) in C3 course

Limits	n=89	AA	BA	BB	CB	CC	DC	DD
	HEC	89.96	88.33	76.66	65	53.33	41.66	30
	Çukurova	79.71	75.31	69.31	61.71	50.51	41.91	34.91
	İstanbul	88	80	73	66	60	55	50
t	Ege	*81	76	71	66	61	56	51
		75.71	66.73	57.76	48.78	39.80	30.83	21.85
t	Adıyaman	*81	76	71	66	61	56	51
		77.72	69.26	60.79	52.33	43.86	35.40	26.93
t	Artvin	*81	76	71	66	61	56	51
		75.71	66.73	57.76	48.78	39.80	30.83	21.85
	İnönü	71.78	63.23	51.94	43.97	34.85	26.46	16.91
t	Niğde	*81	76	71	66	61	56	51
		74.18	64.77	55.36	45.95	36.54	27.13	17.71
	Ankara	88.23	77.72	67.22	56.72	46.22	35.72	25.22
t	Medipol	*79	76.5	74	71.5	69	64	61.5
		76.56	72.28	68.01	63.74	59.46	50.92	46.64
t	Esenyurt	*71	66	61	56	51	46	41
		77.72	69.26	60.79	52.33	43.86	35.40	26.93

Table 4.9. Shows the comparison of letter grading limits (*t values used in the letter grades which are mapped to the equivalent mark border values on [0 , 100]) in C4 course.

Limits	n=89	AA	BA	BB	CB	CC	DC	DD
	HEC	89.96	88.33	76.66	65	53.33	41.66	30
	Çukurova	77.70	73.87	68.98	63.04	53.79	46.72	40.70
	İstanbul	71.48	65.69	58.41	52.66	46.49	42.35	36.13
t	Ege	*77	72	67	62	57	52	47
		78.89	70.87	62.84	54.81	46.78	38.76	30.73
t	Adıyaman	*77	72	67	62	57	52	47
		78.56	70.94	63.31	55.69	48.07	40.45	32.82
t	Artvin	*77	72	67	62	57	52	47
		78.89	70.87	62.84	54.81	46.78	38.76	30.73
	İnönü	78.01	70.47	60.01	53.62	44.09	37.50	29.04
t	Niğde	*77	72	67	62	57	52	47
		79.39	71.02	62.66	54.30	45.94	37.57	29.21
	Ankara	90	85	80	75	70	65	60
	Medipol	77	74.5	72	69.5	67	62	59.5
		75.06	71.46	67.86	64.26	60.66	53.46	49.86
	Esenyurt	65	60	55	50	45	40	35
		75.51	67.89	60.27	52.64	45.02	37.40	29.77

Table 4.10. Shows the comparison of letter grading limits (*t values used in the letter grades which are mapped to the equivalent mark border values on [0 , 100]) in C5 course

Limits	n=148	AA	BA	BB	CB	CC	DC	DD
	HEC	89.96	88.33	76.66	65	53.33	41.66	30
	Çukurova	81.70	77.04	71.04	63.70	52.37	43.70	36.38
	İstanbul	79.40	72.33	63.01	56.66	46.45	41.26	33.65
t	Ege	*79	74	69	64	59	54	49
		86.96	77.28	67.61	57.93	48.25	38.57	28.89
t	Adıyaman	*79	74	69	64	59	54	49
		86.36	77.50	68.64	59.78	50.92	42.06	33.21
t	Artvin	*79	74	69	64	59	54	49
		86.96	77.28	67.61	57.93	48.25	38.57	28.89
	İnönü	86.59	77.38	63.85	56.61	46.78	37.74	46.80
t	Niğde	*79	74	69	64	59	54	49
		87.07	77.22	67.37	57.52	47.66	37.81	27.96
	Ankara	90	85	80	75	70	65	60
t	Medipol	*77	74.5	72	69.5	67	62	59.5
		79.69	75.46	71.23	66.99	62.76	54.30	50.06
t	Esenyurt	*65	60	55	50	45	40	35
		79.27	70.41	61.55	52.69	43.84	34.98	26.12

Table 4.11. Normality Tests for Raw Score Success (RSS) in C1 Course.

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Midterm	**0.087**	84	0.175	0.973	84	**0.069**
Final	**0.144**	84	0.000	0.950	84	0.003
A	**0.081**	84	0.200	0.980	84	**0.209**
B	**0.075**	84	0.200	0.981	84	**0.259**
C	**0.081**	84	0.200	0.980	84	**0.209**
D	**0.081**	84	0.200	0.980	84	**0.209**
E	**0.081**	84	0.200	0.980	84	**0.209**
F	**0.081**	84	0.200	0.980	84	**0.209**
G	**0.081**	84	0.200	0.980	84	**0.209**
H	**0.081**	84	0.200	0.980	84	**0.209**
I	**0.075**	84	0.200	0.976	84	**0.111**
J	**0.081**	84	0.200	0.980	84	**0.209**

* This is a lowerbound of thetruesignificance.
aLillieforsSignificanceCorrection

The results from the Shapiro-Wilk and Kolmogrov-Smirnov tests are presented in the **Tests of Normality** table, as shown. We can see that a Shapiro-Wilk and Kolmogrov-Smirnov tests have been run for each variable. If we look under the "**Sig.**" column located under the "**Shapiro-Wilk**" and “Kolmogrov-Smirnov” columns, we will find the significance value for these tests for each variable.

If the assumption of normality has been violated, the "**Sig.**" value will be less than .05 (i.e., the test is significant at the $p < .05$ level). If the assumption of normality has not been violated, the "**Sig.**" value will be greater than .05 (i.e., $p > .05$). This is because the Shapiro-Wilk and the Kolmogrov-Smirnov tests are testing the null hypothesis that our data's distribution is equal to a normal distribution. Rejecting the null hypothesis means that our data's distribution is not equal to a normal distribution.

In the table above, we can see that all the "**Sig.**" values are greater than .05 . Therefore, our variables are normally distributed except one variable which is the final exam. The comments for the remaining tests follow the same logic.

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Table 4.12. Normality Tests for Raw Score Success (RSS) in C2 Course

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MIDTERM	**0.084**	51	0.200	0.974	51	**0.309**
FINAL	**0.156**	51	0.003	0.877	51	0.000
A	**0.148**	51	0.007	0.966	51	**0.155**
B	**0.115**	51	0.089	0.977	51	**0.424**
C	**0.148**	51	0.007	0.966	51	**0.155**
D	**0.148**	51	0.007	0.966	51	**0.155**
E	**0.148**	51	0.007	0.966	51	**0.155**
F	**0.148**	51	0.007	0.966	51	**0.155**
G	**0.148**	51	0.007	0.966	51	**0.155**
H	**0.148**	51	0.007	0.966	51	**0.155**
I	**0.151**	51	0.006	0.950	51	**0.032**
J	**0.148**	51	0.007	0.966	51	**0.155**

* This is a lowerbound of thetruesignificance.
aLillieforsSignificanceCorrection

Table 4.13. Normality Tests for Raw Score Success (RSS) in C3 Course.

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Midterm	**0.102**	69	0.072	0.961	69	0.031
Final	**0.170**	69	0.000	0.898	69	0.000
A	**0.107**	69	0.049	0.955	69	0.015
B	**0.092**	69	0.200	0.930	69	0.001
C	**0.107**	69	0.049	0.955	69	0.015
D	**0.107**	69	0.049	0.955	69	0.015
E	**0.107**	69	0.049	0.955	69	0.015
F	**0.107**	69	0.049	0.955	69	0.015
G	**0.107**	69	0.049	0.955	69	0.015
H	**0.105**	69	0.058	0.922	69	0.000
I	**0.121**	69	0.014	0.911	69	0.000
J	**0.105**	69	0.058	0.922	69	0.000

* This is a lowerbound of thetruesignificance.
aLillieforsSignificanceCorrection

Table 4.14. Normality Tests for Raw Score Success (RSS) in C4 Course.

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Midterm	**0.088**	66	0.200	0.982	66	**0.440**
Homework	**0.336**	66	0.000	0.675	66	0.000
Final	**0.126**	66	0.011	0.946	66	0.006
A	**0.087**	66	0.200	0.976	66	**0.235**
B	**0.076**	66	0.200	0.986	66	**0.651**
C	**0.087**	66	0.200	0.976	66	**0.235**
D	**0.087**	66	0.200	0.976	66	**0.235**
E	**0.087**	66	0.200	0.976	66	**0.235**
F	**0.087**	66	0.200	0.976	66	**0.235**
G	**0.087**	66	0.200	0.976	66	**0.235**
H	**0.087**	66	0.200	0.976	66	**0.235**
I	**0.104**	66	0.072	0.971	66	**0.131**
J	**0.087**	66	0.200	0.976	66	**0.235**

* This is a lowerbound of thetruesignificance.
aLillieforsSignificanceCorrection

Table 4.15. Normality Tests for Raw Score Success (RSS) in C1 Course.

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Midterm	**0.104**	138	0.001	0.957	138	0.000
Homework	**0.301**	138	0.000	0.676	138	0.000
Final	**0.098**	138	0.003	0.967	138	0.002
A	**0.064**	138	0.200	0.984	138	**0.106**
B	0.043	138	0.200	0.986	138	**0.175**
C	**0.064**	138	0.200	0.984	138	**0.106**
D	**0.064**	138	0.200	0.984	138	**0.106**
E	**0.064**	138	0.200	0.984	138	**0.106**
F	**0.064**	138	0.200	0.984	138	**0.106**
G	**0.064**	138	0.200	0.984	138	**0.106**
H	**0.064**	138	0.200	0.984	138	**0.106**
I	**0.052**	138	0.200	0.978	138	0.027
J	**0.064**	138	0.200	0.984	138	**0.106**

* This is a lowerbound of thetruesignificance.
aLillieforsSignificanceCorrection

Table 4.16. Normality tests for scores which fulfilled the rwquirements of REPL in C1 COURSE.

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
A	**0.166**	25	0.075	0.915	25	0.039
B	**0.110**	14	0.200	0.968	14	**0.846**
C	**0.096**	26	0.200	0.970	26	**0.625**
D	**0.107**	70	0.045	0.939	70	0.002
E	**0.089**	79	0.189	0.962	79	0.019
F	**0.201**	18	0.053	0.894	18	0.045
G	**0.086**	83	0.197	0.971	83	**0.058**
H	**0.081**	84	0.200	0.980	84	**0.209**
I	**0.096**	69	0.190	0.942	69	0.003
J	**0.107**	70	0.045	0.939	70	0.002

* This is a lowerbound of thetruesignificance.
aLillieforsSignificanceCorrection

Table 4.17. Normalitytests for scores which fulfilled the rwquirements of REPL in C2 COURSE

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
A	**0.143**	47	0.018	0.948	47	0.036
B	**0.105**	45	0.200	0.958	45	**0.100**
C	**0.143**	47	0.018	0.948	47	0.036
D	**0.146**	49	0.011	0.965	49	**0.148**
E	**0.147**	50	0.009	0.968	50	**0.188**
F	**0.142**	45	0.023	0.948	45	0.041
G	**0.148**	51	0.007	0.966	51	**0.155**
H	**0.148**	51	0.007	0.966	51	**0.155**
I	**0.149**	49	0.008	0.955	49	**0.061**
J	**0.146**	49	0.011	0.965	49	**0.148**

* This is a lowerbound of thetruesignificance.
aLillieforsSignificanceCorrection

Table 4.18. Normality tests for scores which fulfilled the requirements of REPL in C3 COURSE

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
A	**0.163**	22	0.135	0.885	22	0.015
B	**0.180**	19	0.108	0.910	19	**0.074**
C	**0.163**	22	0.135	0.885	22	0.015
D	**0.122**	44	0.098	0.907	44	0.002
E	**0.108**	53	0.176	0.911	53	0.001
F	**0.166**	21	0.135	0.863	21	0.007
G	**0.099**	61	0.200	0.918	61	0.001
H	**0.105**	69	0.058	0.922	69	0.000
I	**0.129**	42	0.075	0.910	42	0.003
J	**0.122**	44	0.098	0.907	44	0.002

* This is a lowerbound of thetruesignificance.
aLillieforsSignificanceCorrection

Table 4.19. Normality tests for scores which fulfilled the requirements of REPL in C4 COURSE

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
A	**0.083**	47	0.200	0.974	47	**0.385**
B	**0.093**	45	0.200	0.962	45	**0.148**
C	**0.083**	47	0.200	0.974	47	**0.385**
D	**0.076**	61	0.200	0.982	61	**0.492**
E	**0.075**	63	0.200	0.978	63	**0.327**
F	**0.091**	46	0.200	0.962	46	**0.138**
G	**0.074**	64	0.200	0.983	64	**0.508**
H	**0.087**	66	0.200	0.976	66	**0.235**
I	**0.075**	59	0.200	0.972	59	**0.199**
J	**0.076**	61	0.200	0.982	61	**0.492**

* This is a lowerbound of thetruesignificance.
aLillieforsSignificanceCorrection

Table 4.20. Normality tests for scores which fulfilled the requirements of REPL in C5 COURSE

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
A	**0.078**	97	0.165	0.963	97	0.008
B	**0.074**	87	0.200	0.971	87	0.044
C	**0.077**	91	0.200	0.968	91	0.026
D	**0.054**	119	0.200	0.977	119	0.038
E	**0.056**	128	0.200	0.980	128	**0.055**
F	**0.084**	86	0.192	0.959	86	0.008
G	**0.058**	130	0.200	0.979	130	0.043
H	**0.064**	138	0.200	0.984	138	0.106
I	**0.058**	114	0.200	0.977	114	0.047
J	**0.054**	119	0.200	0.977	119	0.038

* This is a lowerbound of thetruesignificance.
aLillieforsSignificanceCorrection

Table 4.21. Descriptive statistics for C1

	N	Mean	Std. Deviation	Minimum	Maximum
Midterm	84	31.83	13.26	0.00	61.00
Final	84	29.25	12.86	7.00	69.00
Raw score					
A	84	30.28	10.90	7.80	58.60
B	84	30.54	10.86	6.50	59.00
C	84	30.28	10.90	7.80	58.60
D	84	30.28	10.90	7.80	58.60
E	84	30.28	10.90	7.80	58.60
F	84	30.28	10.90	7.80	58.60
G	84	30.28	10.90	7.80	58.60
H	84	30.28	10.90	7.80	58.60
I	84	30.03	11.14	9.10	58.20
J	84	30.28	10.90	7.80	58.60
Evaluated					
A	25	43.78	6.00	36.00	58.60
B	14	46.64	6.07	37.50	59.00
C	26	70.77	7.45	58.19	87.19
D	70	60.00	10.14	45.95	87.36
E	79	60.00	10.13	43.75	86.93
F	18	46.06	5.54	40.00	58.60
G	83	60.00	10.12	42.23	86.57
H	84	30.28	10.90	7.80	58.60
I	69	33.15	9.70	20.50	58.20
J	70	33.23	9.41	20.20	58.60

Table 4.21. shows the descriptive statistics for midterm, final, raw success scores and the evaluated scores (Scores which fulfilled the requirements of relative evaluation participation limit and the related regulations) for the 10 univerisites in our study.

Table 4.22. Descriptive statistics for C2

	N	Mean	Std. Deviation	Minimum	Maximum
MIDTERM	51	40.10	21.10	0.00	96.00
FINAL	51	76.16	23.58	8.00	100.00
Rawscore					
A	51	61.73	20.38	12.80	98.40
B	51	58.13	20.00	14.00	98.00
C	51	61.73	20.38	12.80	98.40
D	51	61.73	20.38	12.80	98.40
E	51	61.73	20.38	12.80	98.40
F	51	61.73	20.38	12.80	98.40
G	51	61.73	20.38	12.80	98.40
H	51	61.73	20.38	12.80	98.40
I	51	65.34	20.94	11.60	98.80
J	51	61.73	20.38	12.80	98.40
Evaluated					
A	47	65.21	17.05	36.80	98.40
B	45	62.53	16.70	36.00	98.00
C	47	62.50	17.05	34.09	95.69
D	49	60.00	10.21	38.01	79.29
E	50	60.00	10.20	36.19	78.83
F	45	66.42	16.39	40.00	98.40
G	51	60.00	10.20	35.52	78.35
H	51	61.73	20.38	12.80	98.40
I	49	67.42	18.54	24.00	98.80
J	49	63.63	18.40	24.00	98.40

Table 4.23. Descriptive statistics for C3

	N	Mean	Std. Deviation	Minimum	Maximum
Midterm	69	35.23	22.06	0.00	100.00
Final	69	29.16	22.34	2.00	97.00
Rawscore					
A	69	31.43	15.72	4.00	75.80
B	69	32.20	19.77	5.00	92.50
C	69	31.43	15.72	4.00	75.80
D	69	31.43	15.72	4.00	75.80
E	69	31.43	15.72	4.00	75.80
F	69	31.43	15.72	4.00	75.80
G	69	31.43	15.72	4.00	75.80
H	69	31.59	19.91	5.20	91.00
I	69	30.98	20.24	5.20	89.50
J	69	31.59	19.91	5.20	91.00
Evaluated					
A	22	54.99	15.40	35.60	91.00
B	19	57.05	15.89	38.00	92.50
C	22	76.98	15.40	57.59	112.99
D	44	60.00	10.23	46.91	88.84
E	53	60.00	10.19	47.41	89.52
F	21	55.91	15.15	40.80	91.00
G	61	60.00	10.17	46.90	89.93
H	69	31.59	19.91	5.20	91.00
I	42	42.65	17.65	20.70	89.50
J	44	42.17	17.32	20.00	91.00

Table 4.24. Descriptive statistics for C4

	N	Mean	Std. Deviation	Minimum	Maximum
Midterm	66	39.83	19.41	0.00	100.00
Homework	66	68.94	31.11	0.00	100.00
Final	66	51.36	21.93	1.00	86.00
Rawscore					
A	66	49.66	18.28	8.10	90.60
B	66	48.51	17.65	8.50	92.00
C	66	49.66	18.28	8.10	90.60
D	66	49.66	18.28	8.10	90.60
E	66	49.66	18.28	8.10	90.60
F	66	49.66	18.28	8.10	90.60
G	66	49.66	18.28	8.10	90.60
H	66	49.66	18.28	8.10	90.60
I	66	46.64	18.12	2.70	84.95
J	66	49.66	18.28	8.10	90.60
Evaluated					
A	47	59.12	10.94	38.90	90.60
B	45	59.92	10.46	43.50	90.60
C	47	67.52	10.94	47.30	99.00
D	61	60.00	10.17	39.05	84.90
E	63	60.00	10.16	40.19	84.29
F	46	59.56	10.63	43.40	90.60
G	64	60.00	10.16	35.64	83.70
H	66	49.66	18.28	8.10	90.60
I	59	50.58	14.65	23.28	84.95
J	61	52.64	15.50	20.70	90.60

Table 4.25. Descriptive statistics for C5

	N	Mean	Std. Deviation	Minimum	Maximum
Midterm	138	33.06	22.45	0.00	96.00
Homework	138	73.30	38.32	0.00	100.00
Final	138	49.83	25.12	1.00	94.00
Rawscore					
A	138	47.15	21.74	3.30	93.00
B	138	45.47	21.28	3.80	93.40
C	138	47.15	21.74	3.30	93.00
D	138	47.15	21.74	3.30	93.00
E	138	47.15	21.74	3.30	93.00
F	138	47.15	21.74	3.30	93.00
G	138	47.15	21.74	3.30	93.00
H	138	47.15	21.74	3.30	93.00
I	138	44.15	21.53	2.98	88.25
J	138	47.15	21.74	3.30	93.00
Evaluated					
A	97	58.31	14.72	35.50	93.00
B	87	60.49	13.93	36.40	93.00
C	91	69.41	14.25	45.31	102.81
D	119	60.00	10.08	42.51	82.75
E	128	60.00	10.08	41.82	82.12
F	86	60.96	13.48	40.10	93.00
G	130	60.00	10.08	42.02	82.01
H	138	47.15	21.74	3.30	93.00
I	114	50.91	17.08	20.48	88.25
J	119	52.69	17.87	21.70	93.00

Table 4.26. Shows the Euclidean distances between the letter Grading limits of Universities and HEC.

	C1	C2	C3	C4	C5
A	**14.39**	14.74	**19.28**	**23.72**	**16.58**
B	27.08	24.39	26.65	35.17	28.87
C	31.16	36.46	31.16	30.76	30.51
D	31.16	36.46	31.16	30.76	30.51
E	31.16	36.46	31.16	30.76	30.51
F	81.59	**11.90**	52.51	31.31	34.74
G	31.16	33.85	31.16	30.76	30.51
H	53.51	42.95	19.54	42.95	42.95
I	47.71	41.05	45.24	43.27	43.27
J	36.46	55.57	36.46	47.08	47.08

Since we use the HEC as a reference or control group, we calculated the Euclidean distances between the letter grading limits of universities and HEC. 14.39, 11.90, 19.28, 23.72, 16.58 are the minimum distances for column 2, column3, column4, column5 and column6 respectively. So, we observe that A University students meet small variations and it is the best equivalent .

5. CONCLUSION AND RECOMMENDATIONS

The main objective of this study was to investigate measurement and evaluation systems in some selected Turkish higher education universities. For centuries, measurement and evaluation systems became one of the difficult and controversy topics among the scholars in education.

In the study, the researcher gathered the secondary data, needed for the study, which is based on the students' scores of 5 different courses: C1, C2, C3, C4, C5. Then the researcher analized the data in the area of Microsoft office Excel 2007 and Spss 15.0 package. According to the relative evaluation regulations of the selected universities the data was calculated in Excel. Further more, the results, found in the erea of Excel, were analized in the erea of Spss to run Descriptive statistics, Normality tests, and histograms.

In the normality tests, we found that most of the "**Sig.**" values are greater than .05 . Therefore, our variables are normally distributed except few variable.

There are variations in the spread of grading letters for the five courses.

If we use Higher Education Council conversion table as a reference, we can conclude that scores of Çukurova University students meet small variations and it is the best equivalent .

Based on the findings, the following recommendations can be made. The comparative analysis of the grading schemes, in the selected universities for our research, showed big variation in the distribution of grading letters. For example, a student got CC according to the RES for a university, and according to the RES of other univesity the student got AA. As a limitation, this study examines Measurement and Evaluation Systems for ten selected Turkish Universities only. Classification can be made to all turkish universities which use relative evaluation systems by using different similarity measures, and distance measures. According to the classification results, intervals of raw success scores can be determined for every university using coefficients.

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CURRICULUM VITAE

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APPENDICES

YÜKSEKÖĞRETİM KURULU

4'lük Sistemdeki Notların 100'lük Sistemdeki Karşılıkları

4	100
3.99	99.76
3.98	99.53
3.97	99.30
3.96	99.06
3.95	98.83
3.94	98.60
3.93	98.36
3.92	98.13
3.91	97.90
3.9	97.66
3.89	97.43
3.88	97.20
3.87	96.96
3.86	96.73
3.85	96.50
3.84	96.26
3.83	96.03
3.82	95.80
3.81	95.56
3.8	95.33
3.79	95.10
3.78	94.86
3.77	94.63
3.76	94.40
3.75	94.16
3.74	93.93
3.73	93.70
3.72	93.46
3.71	93.23
3.7	93.00
3.69	92.76
3.68	92.53
3.67	92.30
3.66	92.06
3.65	91.83
3.64	91.60
3.63	91.36
3.62	91.13
3.61	90.90
3.6	90.66
3.59	90.43
3.58	90.20
3.57	89.96
3.56	89.73
3.55	89.50
3.54	89.26
3.53	89.03
3.52	88.80
3.51	88.56
3.5	88.33
3.49	88.10
3.48	87.86
3.47	87.63
3.46	87.40
3.45	87.16
3.44	86.93
3.43	86.70
3.42	86.46
3.41	86.23
3.4	86.00
3.39	85.76
3.38	85.53
3.37	85.30
3.36	85.06
3.35	84.83
3.34	84.60
3.33	84.36
3.32	84.13
3.31	83.90
3.3	83.66
3.29	83.43
3.28	83.20
3.27	82.96
3.26	82.73
3.25	82.50
3.24	82.26
3.23	82.03
3.22	81.80
3.21	81.56
3.2	81.33
3.19	81.10
3.18	80.86
3.17	80.63
3.16	80.40
3.15	80.16
3.14	79.93
3.13	79.70
3.12	79.46
3.11	79.23
3.1	79.00
3.09	78.76
3.08	78.53
3.07	78.30
3.06	78.06
3.05	77.83
3.04	77.60
3.03	77.36
3.02	77.13
3.01	76.90
3	76.66
2.99	76.43
2.98	76.20
2.97	75.96
2.96	75.73
2.95	75.50
2.94	75.26
2.93	75.03
2.92	74.80
2.91	74.56
2.9	74.33
2.89	74.10
2.88	73.86
2.87	73.63
2.86	73.40
2.85	73.16
2.84	72.93
2.83	72.70
2.82	72.46
2.81	72.23
2.8	72.00
2.79	71.76
2.78	71.53
2.77	71.30
2.76	71.06
2.75	70.83
2.74	70.60
2.73	70.36
2.72	70.13
2.71	69.90
2.7	69.66
2.69	69.43
2.68	69.20
2.67	68.96
2.66	68.73
2.65	68.50
2.64	68.26
2.63	68.03
2.62	67.80
2.61	67.56
2.6	67.33
2.59	67.10
2.58	66.86
2.57	66.63
2.56	66.40
2.55	66.16
2.54	65.93
2.53	65.70
2.52	65.46
2.51	65.23
2.5	65
2.49	64.76
2.48	64.53
2.47	64.30
2.46	64.06
2.45	63.83
2.44	63.60
2.43	63.36
2.42	63.13
2.41	62.90
2.4	62.66
2.39	62.43
2.38	62.20
2.37	61.96
2.36	61.73
2.35	61.50
2.34	61.26
2.33	61.03
2.32	60.80
2.31	60.56
2.3	60.33
2.29	60.10
2.28	59.86
2.27	59.63
2.26	59.40
2.25	59.16
2.24	58.93
2.23	58.70
2.22	58.46
2.21	58.23
2.2	58.00
2.19	57.76
2.18	57.53

2.17	57.30
2.16	57.06
2.15	56.83
2.14	56.60
2.13	56.36
2.12	56.13
2.11	55.90
2.1	55.66
2.09	55.43
2.08	55.20
2.07	54.96
2.06	54.73
2.05	54.50
2.04	54.26
2.03	54.03
2.02	53.80
2.01	53.56
2	53.33
1.99	53.10
1.98	52.86
1.97	52.63
1.96	52.40
1.95	52.16
1.94	51.93
1.93	51.70
1.92	51.46
1.91	51.23
1.9	51.00
1.89	50.76
1.88	50.53
1.87	50.30
1.86	50.06
1.85	49.83
1.84	49.60
1.83	49.36
1.82	49.13
1.81	48.90
1.8	48.66
1.79	48.43
1.78	48.20
1.77	47.96
1.76	47.73
1.75	47.50
1.74	47.26
1.73	47.03
1.72	46.80
1.71	46.56
1.7	46.33

1.69	46.10
1.68	45.86
1.67	45.63
1.66	45.40
1.65	45.16
1.64	44.93
1.63	44.70
1.62	44.46
1.61	44.23
1.6	44
1.59	43.76
1.58	43.53
1.57	43.30
1.56	43.06
1.55	42.83
1.54	42.60
1.53	42.36
1.52	42.13
1.51	41.90
1.5	41.66
1.49	41.43
1.48	41.20
1.47	40.96
1.46	40.73
1.45	40.50
1.44	40.26
1.43	40.03
1.42	39.80
1.41	39.56
1.4	39.33
1.39	39.10
1.38	38.86
1.37	38.63
1.36	38.40
1.35	38.16
1.34	37.93
1.33	37.70
1.32	37.46
1.31	37.23
1.3	37.00
1.29	36.76
1.28	36.53
1.27	36.30
1.26	36.06
1.25	35.83
1.24	35.60
1.23	35.36
1.22	35.13

1.21	34.90
1.2	34.66
1.19	34.43
1.18	34.20
1.17	33.96
1.16	33.73
1.15	33.50
1.14	33.26
1.13	33.03
1.12	32.80
1.11	32.56
1.1	32.33
1.09	32.10
1.08	31.86
1.07	31.63
1.06	31.40
1.05	31.16
1.04	30.93
1.03	30.70
1.02	30.46
1.01	30.23
1	30.00