

Comparative Student Success Analysis of Distance Education and Traditional Education in Associate Degree Programs

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ABSTRACT

In this study, success rates of students enrolled in distance education courses to students enrolled in traditional courses at Sakarya University's associate degree programs are compared. Success rates of students enrolled in distance programs and traditional programs in semester spring 2013 were analyzed with outcomes. The comparison is made for the following 3 programs; Computer Programming, Electronic Technologies and Mechatronics. Results indicated that average grades of distance students are lower than those in traditional programs.

Distance associate degree programs of Sakarya University first started in Adapazari Vocational High School in 2003. By 2013, there are 5 programs available, which are Computer Programming, Electronic Technologies, Mechatronics, Information Management, and Internet and Network Technologies. Two of these programs, Information Management, and Internet and Network Technologies programs aren't being lectured in traditional education, only in distance education. For this reason, the other 3 programs which are being lectured in both distance education and traditional education are analyzed.

The students' grades for each course which are common both for distance education and traditional education are analyzed. As a result of these analyzes, it is inferred that traditional education is more successful than distance education in associate degree programs.

Keywords: Distance Education, Traditional Education, Student Success Analysis, Benchmarking of Education Models, Associate Degree Programs.

1. INTRODUCTION

The Southern Association of Colleges and Schools defines distance education "For the purposes of the Commission on College's accreditation review, distance education is a formal educational process in which the majority of the instruction (interaction between students and instructors and among

students) in a course occurs when students and instructors are not in the same place. Instruction may be synchronous or asynchronous. A distance education course may use the internet; one-way and two-way transmissions through open broadcast, closed circuit, cable, microwave, broadband lines, fiber optics, satellite, or wireless communications devices; audio conferencing; or video cassettes, DVD's, and CD-ROMs if used as part of the distance learning course or program." [1].

The Texas Higher Education Coordinating Board (THECB) defines distance education "The formal educational process that occurs when students and instructors are not in the same physical setting for the majority (more than 50 percent) of instruction." [2].

United States Distance Learning Association's distance education definition is "The application of information technology (and infrastructure) to educational and student-related activities linking teachers and students in differing places." [3].

The earliest distance learning activity was in 1728, when Caleb Phillips, a steno teacher announced in the Boston Gazette that he would like to send courses to anyone interested [4].

The applications of open and distance educations at university level started with London University founded in 1836. London University was a university which only made exams and granted high education degrees until 1989. The students were taking courses from other institutions and attending exams at London University. The exam method of London University gave the lead to University South Africa which was founded in 1873 and University of New Zealand which was founded in 1880 [5].

The Open University which was founded in 1968 is the first open university. This university grants undergraduate degree, master's degree and doctoral degree on 91 programs. This university also has certificate programs [6].

When we have a look at the recent situation of American internet based higher education, it can be seen that internet based courses are growing up rapidly. Although 26% of the universities had internet based courses in 1999, this rate has increased up to 67% in 2008. Moreover, while the rate of internet based course was 9.6% in 2002, it is seen that this rate also increased up to 25.3% [7].

Education via letter in Banking and Law of Commerce, Law Faculty, Ankara University in 1950 is said to be the first instance of distance education in Turkey [8].

With the new regulations on the Law of Higher Education of Turkey in 1981, the authorization of granting distance education was given to universities, and 1 year later this mission was given to Anadolu University [9].

In 1999, Turkish Higher Education Council published the Legislation of Distance Education based on inter-universities communication and information technologies [10].

Planning facility of distance education and providing research and studying possibilities in cooperation for universities was aimed in the legislation of Turkish National Informatics Committee on March 1, 2000 [11].

According to matriculation guide of Turkey published in 2012, Computer Programming program has the largest quota among association degree distance education programs. Child Development and Business Administration programs are the second and the third ones respectively. Among undergraduate degree distance education programs, Management, Industrial Engineering and Computer Engineering have the largest quota in the order given.

Distance education activities in Sakarya University have started in 1997 via a simple interface with the course Fundamentals of Information Technologies.

The association degree distance education programs Information Management and Computer Programming started in Sakarya Vocational High School (Sakarya VHS), Sakarya University in academic year 2001/02 are the first internet based distance education projects in Turkey. In academic year 2002/03, all the association degree distance education programs moved from Sakarya VHS to newly founded Adapazari Vocational High School (Adapazari VHS). Furthermore, Management associate degree program was added to these distance education programs in the same academic year.

By the academic year 2013/14, there are 6 active programs in Adapazari VHS which are Information Management, Computer Programming, Internet and Network Technologies, Electronic Technologies, Mechatronics and Occupational Health and Safety.

In this study, students' grades for each course are analyzed and the percentages of students' success are shown in data tables. Although there is only one school teaching the analyzed programs for distance associate degree; Adapazari VHS, there are 4 different schools for traditional associate degree; Hendek VHS, Karasu VHS, Kaynarca VHS and Sakarya VHS.

The comparison is made for the following 3 programs; Computer Programming, Electronic Technologies and

Mechatronics. There are 6 courses available for Computer Programming, 6 courses for Electronic Technologies, and 4 courses for Mechatronics. Moreover, there are two options for traditional education; daytime and evening education. The success rates for both education types are shown in the data tables as well. The final data table shows the success rates of distance education since 2010 for both spring and fall semesters. In addition, the success rates of Information Management and Internet and Network Technologies programs which are being lectured only in distance education are provided.

2. LITERATURE REVIEW

Rivera and Rice compared the three instruction methods (traditional, web based and blended) by means of student performance, student satisfaction, and lecturer experience. In their study, students' performance was measured by examination grades and it has been seen that there's no significant difference between these three instruction methods [12].

Scott has compared the successful completion and retention rates between distance education and traditional education in Californian Colleges. While the success rate of distance education was 53% in 2005/06, this rate rose to 57% in 2009/10. Likely, the success rate of traditional education rose from 64% to 67% in the same period. The gap for the success rate between traditional education and distance education decreased from 11% to 10%. Besides, the success rate for distance education grew by 2% in one year from 2008/09 to 2009/10, while the success rate for traditional courses remained the same [13].

In a study conducted by the U.S. Department of Education in 2009, it is deduced that students performed better in an online education situation than in face-to-face situations between 1996 and 2008 [14].

Harris and Parrish compared online and traditional courses and found that there was a significant difference in the learning outcomes and that the face-to-face students received significantly higher grades and had a lower dropout rate than the distance education students [15].

3. STUDENT SUCCESS ANALYSIS

In this study, 3 associate degree programs which are granted in both distance education and traditional education were compared by means of students' grades. Since Adapazari Vocational High School teaches only distance education programs, in order to be able to make comparison, the programs which are common in Adapazari VHS and other vocational high schools in Sakarya University which have traditional education programs were evaluated. These common programs are Computer Programming, Electronic Technologies and Mechatronics. In order to achieve the most realistic comparison, the common courses in these programs were chosen and students' grades were analyzed.

Firstly, students' grades in each common course in each vocational high school were classified according to the grading system used in Sakarya University (Table 1). As seen in Table 1, grades from DD to AA mean that the student is successful.

The success rate of a course is calculated by dividing the number of successful students to the number of total students taking the course. Table 2 shows the success rates for each common course in each vocational high school.

Success Rate	Grade
AA	90-100
BA	85-89
BB	80-84
CB	75-79
CC	65-74
DC	58-64
DD	50-57
FF	0-49
GR	Did not attend the final exam
DZ	Unsuccessful because of absenteeism

Table 1. Grading system used in Sakarya University

Considering the total of course grades on Table 2, cumulative success rate of each program in each vocational high school is given in Table 3. The success rates of daytime and evening educations in traditional education can be seen in this table as well. Additionally, the success rates of Internet and Network Technologies and Information Management programs which are only granted by distance education can be seen on this table.

Course 1.1	Computer Networks
Course 1.2	Graphics & Animation
Course 1.3	Internet Programming
Course 1.4	Micro Systems
Course 1.5	Total Quality Management
Course 1.6	Data Structures
Course 2.1	Alternative Current Circuit Analysis
Course 2.2	Analog Electronics
Course 2.3	Maintenance
Course 2.4	CAD
Course 2.5	Automation Systems
Course 2.6	Principles of Technology
Course 3.1	CAD
Course 3.2	Machine Elements
Course 3.3	Material Technology
Course 3.4	Mechanic Systems Design

NOS	Number of students
SR	Success rate

According to the results obtained from Table 3, distance education in Computer Programming and Electronic Technologies programs are less successful compared to traditional education. In addition, although the success rate of distance education in Mechatronics program is lower compared to evening traditional education, it is slightly higher compared to daytime traditional education. Furthermore, it can be concluded that distance education is less successful than traditional education in general.

Only the distance education programs in Adapazari VHS were taken into consideration in Table 4, and the number of students along with success rates of these programs between academic years 2010/11 and 2012/13 were shown. The change of success rates in distance education programs can be clearly seen in this table.

4. CONCLUSION

In this study, a comparison is made between distance education and traditional education based on the grades of students in vocational high schools in Sakarya University. As a result of the analysis, it is seen that distance education is less successful than traditional education. In addition, it can be seen that there's no significant change in success rates in distance education over the years. There may be many reasons causing these results. For instance, most of the students who chose distance education work in a full-time job and cannot spare time to study or even attend to the exams. Other possible reason is that these students cannot adapt their selves to a complete new system in which they have to do perfect time management and study by their own. Researching the cause of low success rates can be a subject to further studies.

Program 1	Computer Programming
Program 2	Electronic Technologies
Program 3	Mechatronics
Program 4	Information Management
Program 5	Internet and Network Technologies

DE	Distance Education
TE-1	Traditional Education (Daytime)
TE-2	Traditional Education (Evening)

Program	Course	School	Education Type	AA	BA	BB	CB	CC	DC	DD	DZ	FF	GR	SR
Program 1	Course 1.1	Adapazari	DE	1	3	1	8	30	31	36		24	60	0,57
Program 1	Course 1.1	Hendek	TE-1	1	2		1	4	4	2		2	5	0,67
Program 1	Course 1.1	Hendek	TE-2	2		4	2	6	5	6			14	0,64
Program 1	Course 1.1	Karasu	TE-1	5		2	2	1	4	10	3	3	13	0,56
Program 1	Course 1.1	Karasu	TE-2	3	3	7	7	13	4	10		1	14	0,76
Program 1	Course 1.1	Kaynarca	TE-1					2	2	4			2	0,80
Program 1	Course 1.1	Kaynarca	TE-2					2	1	6		1		0,90
Program 1	Course 1.1	Sakarya	TE-1	2	3	2	3	11		2			8	0,74
Program 1	Course 1.2	Adapazari	DE	7	9	16	14	36	31	36		13	51	0,70
Program 1	Course 1.2	Hendek	TE-1	7	2	1	6	9	6	3			8	0,81
Program 1	Course 1.2	Hendek	TE-2	2	3	1	5	14	11	6			3	0,93
Program 1	Course 1.2	Karasu	TE-1	6	6	4	3	15	16	13		3	17	0,76
Program 1	Course 1.2	Karasu	TE-2	12	4	6	3	16	13	20		2	8	0,88
Program 1	Course 1.2	Kaynarca	TE-1	10	5	11	4	9	5	1			8	0,85
Program 1	Course 1.2	Kaynarca	TE-2	5	1	8	8	22	2	4			1	0,98
Program 1	Course 1.2	Sakarya	TE-1	2	5	4		5	6	3		6	23	0,46
Program 1	Course 1.3	Adapazari	DE			2		24	43	26		45	102	0,39
Program 1	Course 1.3	Hendek	TE-1	2	1	1		2	4	6		3	8	0,59
Program 1	Course 1.3	Hendek	TE-2	3			1	6	4	6		9	10	0,51
Program 1	Course 1.3	Karasu	TE-1	3	1	3	2	5	1	6		3	13	0,57
Program 1	Course 1.3	Karasu	TE-2	5	1	2	4	13	9	8		11	12	0,65

Program	Course	School	Education Type	AA	BA	BB	CB	CC	DC	DD	DZ	FF	GR	SR
Program 1	Course 1.3	Kaynarca	TE-1	1		1			1	4		1	2	0,70
Program 1	Course 1.3	Kaynarca	TE-2			1		3	2	2		1	1	0,80
Program 1	Course 1.3	Sakarya	TE-1			3	3	8	4	6		3	13	0,60
Program 1	Course 1.4	Adapazari	DE		1	2	2	11	23	35		33	72	0,41
Program 1	Course 1.4	Hendek	TE-1	1		1	1	3	7	7	1	4	5	0,67
Program 1	Course 1.4	Hendek	TE-2	1			1	4	5	14	2	10	7	0,57
Program 1	Course 1.4	Karasu	TE-1	3	1	1	2	3	3	3	7	5	8	0,44
Program 1	Course 1.4	Karasu	TE-2	6	1	6	2	5	10	11	12	2	3	0,71
Program 1	Course 1.4	Kaynarca	TE-1				2	2		1	2	3		0,50
Program 1	Course 1.4	Kaynarca	TE-2		1	3	1	4			1			0,90
Program 1	Course 1.4	Sakarya	TE-1	2	4	5	5	3			8		4	0,61
Program 1	Course 1.5	Adapazari	DE				3	18	34	39		17	56	0,56
Program 1	Course 1.5	Hendek	TE-1	2	1	2	2	10	3	7		7	13	0,57
Program 1	Course 1.5	Hendek	TE-2	1		2		13	7	8		10	4	0,69
Program 1	Course 1.5	Karasu	TE-1	5	6	11	8	22	8	8		1	12	0,84
Program 1	Course 1.5	Karasu	TE-2	7	5	8	11	17	19	6			8	0,90
Program 1	Course 1.5	Kaynarca	TE-1		1	1	6	20	7	7		3	6	0,82
Program 1	Course 1.5	Kaynarca	TE-2	1	2	3	4	12	14	11		1	1	0,96
Program 1	Course 1.5	Sakarya	TE-1	10	5	6	7	11	1				8	0,83
Program 1	Course 1.6	Adapazari	DE	2		5	5	13	28	5		51	104	0,27
Program 1	Course 1.6	Hendek	TE-1	3	3	2	4	9	9	8		2	10	0,76
Program 1	Course 1.6	Hendek	TE-2	2	2	1	1	14	13	10		2	10	0,78
Program 1	Course 1.6	Karasu	TE-1	2	2	1	2	5	6	12	9	41	19	0,30
Program 1	Course 1.6	Karasu	TE-2		1	4	2	3	13	19	3	28	27	0,42
Program 1	Course 1.6	Kaynarca	TE-1	4	5	9	8	11	6		7		2	0,83
Program 1	Course 1.6	Kaynarca	TE-2	4	6	10	4	13	10		3			0,94
Program 1	Course 1.6	Sakarya	TE-1	3		2	1	6	3	5		9	23	0,38
Program 2	Course 2.1	Adapazari	DE				2	12	64	8		44	71	0,43
Program 2	Course 2.1	Hendek	TE-1	1			1	2	5	15		20	19	0,38
Program 2	Course 2.1	Hendek	TE-2	1				6	5	13		23	12	0,42
Program 2	Course 2.1	Sakarya	TE-1	5	1	3	2	9	8	3		15	25	0,44
Program 2	Course 2.1	Sakarya	TE-2			3	4	4	6	4		18	30	0,30
Program 2	Course 2.2	Adapazari	DE	3	1		2	15	21	6		60	96	0,24
Program 2	Course 2.2	Hendek	TE-1	1	3			3	7	8		16	16	0,41
Program 2	Course 2.2	Hendek	TE-2	3	3			4	9	14		19	10	0,53
Program 2	Course 2.2	Sakarya	TE-1	3	2	3	8	9	15	7	14	3	9	0,64
Program 2	Course 2.2	Sakarya	TE-2		4	2	5	8	15	8	21	4	17	0,50
Program 2	Course 2.3	Adapazari	DE	2	3	4	9	19	11	21		34	47	0,46
Program 2	Course 2.3	Hendek	TE-1	5	1		3	9	5	16		4	4	0,83
Program 2	Course 2.3	Hendek	TE-2	1	1		2	6	4	15		2	5	0,81
Program 2	Course 2.3	Sakarya	TE-1	4	3	2		11	9	4			8	0,80
Program 2	Course 2.3	Sakarya	TE-2	1		4	1	5	11	4			12	0,68
Program 2	Course 2.4	Adapazari	DE				4	8	14	20		16	33	0,48
Program 2	Course 2.4	Hendek	TE-1	2	2	2		5	2	9		6	26	0,41
Program 2	Course 2.4	Hendek	TE-2	1				1	2	15		18	19	0,34
Program 2	Course 2.4	Sakarya	TE-1	4	2	5	5	9	6	8	7	1	2	0,80
Program 2	Course 2.4	Sakarya	TE-2	4	1	2	7	3	5	6	10	4	13	0,51
Program 2	Course 2.5	Adapazari	DE	4	3	3	5	9	11	17		44	61	0,33
Program 2	Course 2.5	Hendek	TE-1	5	3	1	4	7	6	4		6	12	0,63
Program 2	Course 2.5	Hendek	TE-2	2	4	1	3	4	2	3		7	13	0,49
Program 2	Course 2.5	Sakarya	TE-1	1	4	5	2	6	8	7			9	0,79
Program 2	Course 2.5	Sakarya	TE-2	1	1	5	2	7	1	4		1	15	0,57
Program 2	Course 2.6	Adapazari	DE		5	2	4	32	45	21		21	83	0,51
Program 2	Course 2.6	Hendek	TE-1	2			1	17	12	34		4	17	0,76
Program 2	Course 2.6	Hendek	TE-2			4	5	22	18	16	6	9	3	0,78
Program 2	Course 2.6	Sakarya	TE-1	6	2	6	6	11	5	7		6	24	0,59
Program 2	Course 2.6	Sakarya	TE-2	3	3	3	2	4	5	11		17	38	0,36
Program 3	Course 3.1	Adapazari	DE	3	7	16	30	72	7			7	16	0,85
Program 3	Course 3.1	Sakarya	TE-1	14	6	4	6	1	2	2	29		2	0,53
Program 3	Course 3.1	Sakarya	TE-2	7	3	1	1	5	7	6		7	3	0,75
Program 3	Course 3.2	Adapazari	DE	4	4	11	11	45	30	22		49	53	0,55
Program 3	Course 3.2	Sakarya	TE-1	2	1	3	2	5	2	3	20			0,47
Program 3	Course 3.2	Sakarya	TE-2	4	1		1	3	9	10				1,00
Program 3	Course 3.3	Adapazari	DE	1		5	4	21	43	38		38	51	0,56
Program 3	Course 3.3	Sakarya	TE-1	1	8	6	8	19	3				29	0,61
Program 3	Course 3.3	Sakarya	TE-2	4	2	4	9	19	1				2	0,95
Program 3	Course 3.4	Adapazari	DE	5	1	8	4	26	23	16		52	66	0,41
Program 3	Course 3.4	Sakarya	TE-1	1	1	1	1	9	4	11	27	8	8	0,39
Program 3	Course 3.4	Sakarya	TE-2	4	1			7	5	10		8	5	0,68

Table 2. Success rates for each common course in each vocational high school.

Program	School	Education Type	AA	BA	BB	CB	CC	DC	DD	DZ	FF	GR	SR
Program 1	Adapazari	DE	10	13	26	32	132	190	177	0	183	445	0,48
Program 1	Hendek	TE-1	16	9	7	14	37	33	33	1	18	49	0,69
Program 1	Hendek	TE-2	11	5	8	10	57	45	50	2	31	48	0,70
Program 1	Karasu	TE-1	24	16	22	19	51	38	52	19	56	82	0,59
Program 1	Karasu	TE-2	33	15	33	29	67	68	74	15	44	72	0,71
Program 1	Kaynarca	TE-1	15	11	22	20	44	21	17	9	7	20	0,81
Program 1	Kaynarca	TE-2	10	10	25	17	56	29	23	4	3	3	0,94
Program 1	Sakarya	TE-1	19	17	22	19	44	14	16	8	18	79	0,59
Program 4	Adapazari	DE	14	7	6	23	127	78	70	0	63	189	0,56
Program 2	Adapazari	DE	9	12	9	26	95	166	93	0	219	391	0,40
Program 2	Hendek	TE-1	16	9	3	9	43	37	86	0	56	94	0,58
Program 2	Hendek	TE-2	8	8	5	10	43	40	76	6	78	62	0,57
Program 2	Sakarya	TE-1	23	14	24	23	55	51	36	21	25	77	0,65
Program 2	Sakarya	TE-2	9	9	19	21	31	43	37	31	44	125	0,46
Program 5	Adapazari	DE	51	35	38	66	203	210	199	0	206	244	0,64
Program 3	Adapazari	DE	13	12	40	49	164	103	76	0	146	186	0,58
Program 3	Sakarya	TE-1	18	16	14	17	34	11	16	76	8	39	0,51
Program 3	Sakarya	TE-2	19	7	5	11	34	22	26	0	15	10	0,83

Table 3. Cumulative success rate of each program in each vocational high school.

Program	Education Type	2010-2011				2011-2012				2012-2013			
		Fall		Spring		Fall		Spring		Fall		Spring	
		NOS	SR	NOS	SR	NOS	SR	NOS	SR	NOS	SR	NOS	SR
Information Management	DE	431	0,67	396	0,66	258	0,65	200	0,55	102	0,43	382	0,56
Computer Programming	DE	918	0,74	826	0,65	654	0,57	553	0,45	512	0,57	660	0,48
Electronic Technologies	DE	633	0,69	540	0,64	496	0,49	377	0,44	385	0,40	551	0,40
Business Management	DE	422	0,67	374	0,63	247	0,64	207	0,48	125	0,46		
Mechatronics	DE	813	0,72	748	0,73	584	0,50	435	0,53	465	0,44	897	0,58
Internet & Network Technologies	DE	N/A	N/A	N/A	N/A	141	0,61	116	0,65	226	0,72	264	0,64

Table 4. The number of students and success rates of distance education programs.

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