

## USABILITY LEVEL OF DISTANCE EDUCATION WEBSITE (SAKARYA UNIVERSITY SAMPLE)

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### ABSTRACT

The main goal of this research is to determine the usability of Sakarya University Adapazarı Vocational Two-Year Community College's Web Site. A scale was developed to the evaluation and applied to 1512 students. From the applied questionnaire only appropriate ones were selected to be evaluated and 1229 questionnaire were analysed.

Finally, usability level of distance education's web site was analysed according to the comments of the students of Sakarya University Adapazarı Vocational Two-Year Community College and was analyzed whether there is a meaningful difference in based on their genders, ages, departments, university years and geographical conditions or not.

Results of the research revealed that students feel contented with usability of distance education's web site. In the analysis done according to the gender variable, when compared to the male students , female students; according to the age variable, when compared to the old students , the young students; according to the department variable, when compared to the students of other departments, the students of Mechatronics and Business Management Department; according to the university years variable, when compared to the senior students, the freshmen; according to the geographical conditions variable, when compared to the students of other regions, the students living in Mediterranean region are not content with usability of web site in some factors.

### INTRODUCTION

The telecommunications technologies have affected the education and instruction processes. The fact that these new technologies are in a race against time has culminated in the evolution of certain issues such as all of the existing learning-instruction theories, instruction methods, environmental design in parallel to the technology. One of the concepts triggered by these evolving theories is usability.

Usable websites enable the user to get the most efficiency from the websites by increasing the level of user-website interaction. Usability is an important concept for distance education sites as well because usable websites allow students to learn more effectively and attractively. The learning level will be enhanced in proportion to how efficiently the students use the website and how well the student-website interaction occurs. Then we ask, how usable are the distance education websites?

In recent years, there has been an increasing volume of literature about usability in distance education but there has been little research into the usability. The purpose of the present study was to analyze what relationship occurred between students' perception of distance education in relation to gender, age, department, geographic region of living and years spent in the university variable and was to determine the usability level of a website that is used for instruction purposes by an institution with a distance education division.

### Problem Statement

Using the current literature as a guide, this study attempted to answer the following questions:

1. Do the students that receive the distance education services find the website useful?
2. Is there a meaningful difference based on gender variable?
3. Is there a meaningful difference based on age variable?
4. Is there a meaningful difference based on department variable?
5. Is there a meaningful difference based on geographic region of living variable?
6. Is there a meaningful difference based on years spent in the university variable?

### Significance of the Study

The results can be used by distance educators to determine the benefit of the usability in distance education website systems. Several studies such as Ahlstrom & Longo (2001); Hutchinson (2002); Nielsen (2000; 2008), Moberand & Spyridakis (2002) have stated that there may be differences in using web sites if the web sites designed in the terms of usability.

### **Inferences**

In order to draw the outline of the study, various inferences have been made, which we can list as follows:

1. We think that distance education method will be the educational system of the future and is going to keep up with the advancing world.
2. We believe that distance education websites created with respect to the usability concepts will be beneficial to the students learning efforts.
3. We believe that the prepared distance education websites should be tailored to conform to the usability concepts by analyzing them with various methods.
4. We believe that the “gaining experience at the website” principle can be materialized when the existing distance education websites are habilitated to comply with the usability concepts.

### **Scope & Limitations**

In this study, a sample size of 1512 students was used. These students were selected from 5,028 students who enrolled in Adapazari Vocational Two-Year Community College Distance Education Department of Sakarya University in the province of Sakarya during the academic year 2006–2007.

The study is subject to the following limitations:

1. The data was collected through the distribution and collection of a survey and was therefore limited by distance education provided by respond.
2. The study assumed truthful candid responses by respondents who understood the survey questions and directions and were not fearful of reprisal for their completion of the survey instrument.
3. The responses to the survey items by the respondents were subject to unknown personal biases and perceptions.
4. The study was non-experimental in that the investigator doesn't have manipulative control of the independent variables; therefore, no explicit cause and effect relationship can be determined.
5. It is also must be assumed that the students enrolled in a class delivered via the internet during winter quarter 2006 were representative of university students taking distance education courses.

### **METHOD**

The study has been based on the descriptive and relational survey. In the course of conducting the study, descriptive survey has been used for the purpose of defining the existing situation as completely and carefully as possible. In this survey method, the perceptions of the students receiving distance education from Sakarya University Adapazari Vocational School of Higher Education regarding the distance education website have been examined. On the other hand, in the relational survey method, the study attempts to find out if there is any significant differences between the answers given to the student surveys and the students' genders, departments, ages, years of enrollment at the university and the regions of living.

### **Sample**

The universe of the study is constituted by all the students enrolled at Sakarya University Adapazari Vocational School of Higher Education during the 2006-2007 educational year. All of the 5,028 students enrolling at Sakarya University Adapazari Vocational School of Higher Education have been asked to fill in the survey, but only 1,512 of them had filled it.

At the outset of the study, literary review had been held and topics such as the internet, the internet's history, its utilization in education, distance education, history of distance education, principles of website design, usability and preparation of usable websites have been researched. Afterwards, the elaborated survey has been carried out on the distance education receiving students at Sakarya University Adapazari Vocational School of Higher Education. The data collected by the surveys have been reported by employing the descriptive statistics method, t-test and ANOVA.

### **Instrument**

The survey used in the study to measure the usability level of the distance education websites had been prepared by the researcher by consulting professional advisors. During the preparation of the survey, the website usability surveys existing in the literature have been examined and 41 questions were carved out. These questions had been collected under 6 factors and then were presented for expert opinion. The survey that was evaluated in accordance with the expert opinions comprised of the following factors; “controllability”, “learnability”, “helping”, “appearance”, “effectiveness” and “satisfaction”. 5 questions measure controllability factor, 5 of them measure learnability, 5 of them measure helping, 5 of them measure appearance, 13 of them measure effectiveness and 8 of them measure overall satisfaction.

**Data Collection**

The survey was sent to Directorate of Sakarya University Adapazarı Vocational School of Higher Education and it had been available for the students’ review for a full month between February 15<sup>th</sup> – March 15<sup>th</sup>, 2007 on distance education website’s related section. Of the 1,512 total surveys filled in by the students, the inconsistent surveys had excluded and the remaining 1,229 were used in the analysis.

After the assessment of the survey reliability; the total consistency reliability was measured at Cronbach  $\alpha=0,940$ . Regarding the factor based reliability readings; Cronbach  $\alpha$  values for controllability, learnability, helping, appearance, effectiveness and satisfaction were found to be 0.614, 0.600, 0.633, 0.667, 0.667 and 0.859 respectively.

**FINDINGS**

The demographic characteristics of the students participating in the study are as follows:

**Table 1: Distribution of Participants by Gender**

Gender Distribution		
	Frequency	Percentage
Female	807	65,7
Male	422	34,3
<b>Total</b>	1,229	100

When the distribution of participants by gender is examined through Table 1, it’s seen that the total is comprised of 65.7% (f=807) female and 34.3% (f=422) male participants. In general, it can be stated females constitute the majority of the participants.

**Table 2: Distribution of Participants by Age**

Age Distribution		
Age Interval	Frequency	Percentage
18-20	473	38,5
21-23	263	21,4
24-26	148	12,0
27 and older	345	28,1
<b>Total</b>	1,229	100

When the breakdown of participants by age is examined through Table 2, it’s seen that the total is comprised of 38.5% (f=473) ages 18-20, 21.4% (f=263) ages 21-23, 12.0% (f=148) ages 24-26 and 28.1% (f=345) ages 27 and older. In general, it can be stated that students at the ages of 18-20 constitute the majority of the participants.

**Table 3: Distribution of Participants by Department**

Departmental Distribution		
	Frequency	Percentage
Industrial Electronics	202	16,4
Computer Technology and Programming	300	24,4
Information Management	229	18,6
Mechatronics	243	19,8
Business Management	255	20,7
<b>Total</b>	1,229	100

When the distribution of participants by department is examined through Table 3, it's seen that the total is comprised of 16.4% (f=202) Industrial Electronics, 24.4% (f=300) Computer Technology and Programming, 18.6 (f=229) Information Management, 19.8% (f=243) Mechatronics and 20.7% (f=255) Business Management students. In general, it can be stated that the students enrolled at the Computer Technology and Programming department constitute the majority of the participants.

**Table 4: Distribution of Participants by Geographic Region of Living**

Geographic Region		
	Frequency	Percentage
Marmara Region	861	70.1
Aegean Region	125	10.2
Mediterranean Region	16	1.3
Central Anatolia Region	142	11.6
Black Sea Region	66	5.4
Eastern Anatolia Region	12	1.0
Southeastern Anatolia Region	7	0.6
<b>Total</b>	1,229	100

When the distribution of participants by geographic region of origin of the students is examined through Table 4, it's seen that the regional distribution is as follows; 70.1% (f=861) Marmara Region, 10.2% (f=125) Aegean Region, 1.3% (f=16) Mediterranean Region, 11.6% (f=142) Central Anatolia Region, 5.4% (f=66) Black Sea Region, 1.0% (f=12) Eastern Anatolia Region, 0.6% (f=7) Southeastern Anatolia Region. In general, it can be stated that the students coming from Marmara Region constitute the majority of the participants.

**Table 5: Distribution of Participants by Years of Enrollment at the University**

Years of Enrollment		
	Frequency	Percentage
1 <sup>st</sup> Year	694	56.5
2 <sup>nd</sup> Year	476	38.7
3 <sup>rd</sup> Year and above	59	4.8
<b>Total</b>	1,229	100

When the distribution of participants by years of enrollment is examined through Table 5, it's seen this parameter has the following distribution; 56.5% (f=694) 1<sup>st</sup> year, 38.7% (f=476) 2<sup>nd</sup> year and 4.8% (f=59) 3<sup>rd</sup> year or higher. In general, it can be stated that freshmen students constitute the majority of the participants.

**The Analysis of Factors with Respect to Average Values**

The factors and features that are the most and least preferred by the students regarding the distance education website of Sakarya University Adapazari Vocational School of Higher Education, where they are enrolled at are as follows:

**Table 6. The Analysis of Factors with Respect to Average Values**

Average Value of Factors		
Factors	$\bar{X}$	Sd
Helping	3,62	0.582
Controllability	3,60	0.613
Learnability	3,59	0.579
Satisfaction	3,58	0.607
Effectiveness	3,57	0.497
Appearance	3,51	0.599

The analysis of factors with respect to average values indicated that , the distance education website feature that received the highest approval rating from the students is the helping of the website to the student ( $\bar{X}$  = 3.62). This is trailed closely by controllability ( $\bar{X}$  = 3.60) and learnability factors ( $\bar{X}$  = 3.59). After them, satisfaction ( $\bar{X}$  = 3.58), effectiveness ( $\bar{X}$  = 3.57) and appearance ( $\bar{X}$  = 3.51) take place in order. If we happen to scrutinize the most and least preferred factors:

**Table 7: The Analysis of Items with Respect to Average Values**

Average Value of Items					
Item	$\bar{X}$	Sd	Item	$\bar{X}$	Sd
I am self-confident while using the website	3.91	0.726	I can finish the tasks in a reasonable period of time	3.63	0.900
The terms displayed in the website are understandable	3.85	0.726	The order of the pages is not confusing	3.63	0.942
I think that most people can learn using the websites in a short period of time	3.85	0.791	I don't think there is any inconsistency in the website content	3.61	0.957
It is very easy to learn using this website	3.84	0.845	Data entry locations are not confusing	3.61	0.918
I am content with this website	3.82	0.778	The security of the website is well prepared	3.60	1.00
I am not having any difficulty with reading the characters on the pages	3.82	1.14	Website is providing information about itself on an adequate level	3.57	0.929
The information on the website can be easily understood	3.80	0.733	I don't think surfing through the website is hard	3.55	1.03
I don't find this website complicated	3.79	0.840	I don't think there is any inconsistency with the visual design of the website	3.49	1.00
Adequate technical support is provided to use the website	3.79	0.780	It is easy to find new features of the website by trial and error	3.46	0.989
I think I can frequently use this website	3.76	0.852	I think the supplementary tools on the website (calendar, dictionary, etc.) are coherent with the website	3.35	0.846

The help messages appearing on the display are beneficial	3.76	0.957	Content of the website has fulfilled my expectations	3.34	0.846
It is easy to surf from one page to another on the website	3.75	0.839	While using the website, whenever I commit a mistake, I can find a quick and easy solution	3.34	0.863
Use of terms are always consistent throughout the website	3.74	0.682	The functional tools on the website (calendar, dictionary, etc.) are clearly identified	3.32	1.06
I feel comfortable with myself while using the website	3.73	0.888	Organization of the information is not confusing	3.25	0.824
The website has been created in a compatible fashion with the target audience	3.71	0.817	The website opens fast	3.23	1.04
I find it easy to navigate to the specific page I want on the website	3.69	1.09	I like the visual design of the website	3.22	0.913
The location of the displayed messages are consistent	3.68	0.804	The website possesses all of the qualifications and features that I expected from it	3.21	0.911
I would like to use this website again in the future	3.68	0.904	The visual design of the website is attractive	3.19	0.909
The website's design help me to learn using it	3.65	0.823	I don't think that I must learn a great deal about the website prior to using it	3.16	1.17
Error messages appear on an adequate level of frequency	3.64	0.787	The website is visually enticing	3.02	0.940
It is easy to locate the information I need on this website	3.64	0.865			

**Note:** During the preparation of this analysis, responses to the negative items have been reversed and added to the positive items' results.

The analysis of items with respect to average values revealed that, the most preferred items are ordered as follows: "I am confident with myself while using the website" ( $\bar{X} = 3.91$ ), "Terms used in the website are understandable" ( $\bar{X} = 3.85$ ) and "I think that most people can learn using the websites in a short period of time" ( $\bar{X} = 3.85$ ).

On the other hand, the least preferred items are ordered as follows: "This website's appearance is attractive" ( $\bar{X} = 3.02$ ), "I don't think that I need to learn a great deal about the website prior to using it effectively" ( $\bar{X} = 3.16$ ) and "The websites visual design is attractive" ( $\bar{X} = 3.19$ ).

#### **Factor Based Analysis Performed Regarding the Opinion of the Students on the Distance Education Website's Usability (t-test and One Way ANOVA)**

In this section, by examining the students' answers given to the items, a study has been conducted to determine if there is a meaningful factor based difference that can be traced to the variables of gender, age, department, geographic region of living and years of enrollment at the university. The results of the double average difference significance test (t-test) for the gender variable and the values for the one-tailed variance analysis (one-way ANOVA) conducted for the remaining variables have been given in table format. The findings disregard the error margin of  $P < 0.05$ , i.e. on the order of 5%, and the results are evaluated as possessing 95% confidence (Büyüköztürk, 2003).

**Table 8: Factor Based Results of the t-test Analysis Regarding the Students' Gender and Their Opinions on the Distance Education Website's Usability**

Questions	Gender	N	$\bar{X}$	Ss	Sd	t	P
Controllability	Female	807	3.58	0.632	0.022	1.83	0.067
	Male	422	3.65	0.572	0.027		
Learnability	Female	807	3.57	0.601	0.021	2.19	0.035*
	Male	422	3.64	0.531	0.025		
Helping	Female	807	3.60	0.612	0.021	2.01	0.044*
	Male	422	3.66	0.515	0.025		
Appearance	Female	807	3.50	0.632	0.022	1.12	0.259
	Male	422	3.54	0.531	0.025		
Effectiveness	Female	807	3.55	0.515	0.018	2.09	0.037*
	Male	422	3.61	0.460	0.022		
Satisfaction	Female	807	3.57	0.638	0.022	0.804	0.421
	Male	422	3.60	0.542	0.026		

P<0.05 \*A significant difference exists

When Table 8 is looked through, significant differences on P<0.05 level are observed in the following factors concerning the gender variable's effect;

- Learnability factor (t= -2.19, P=0.035),
- Helping factor (t= -2.01, P=0.044),
- Effectiveness factor (t= -2.09, P=0.037)

A significant difference on P<0.05 level is observed regarding the learnability factor in terms of gender variable. As a result of the analysis performed, males ( $\bar{X}$  =3,64) significantly find the website easier to learn than females do ( $\bar{X}$  =3,57).

A significant difference on P<0.05 level is observed regarding the helping factor in terms of gender variable. As a result of the analysis performed, males ( $\bar{X}$  =3.66) significantly find the website more helping to the user than females do ( $\bar{X}$  =3.60).

A significant difference on P<0.05 level is observed regarding the effectiveness factor in terms of gender variable. As a result of the analysis performed, males ( $\bar{X}$  =3,61) significantly find the website more effective than females do ( $\bar{X}$  =3.55).

**Table 9: Factor Based Results of the Variance Analysis Regarding the Students' Age Groups and Their Opinions on the Distance Education Website's Usability**

Factors	Age Group	N	$\bar{X}$	Ss		Sum of Squares	Sd	Average of Squares	F	P
Controllability	18-20	473	3.58	0.567	Between the Groups	1.78	3	0.576	1.58	0.190
	21-23	263	3.57	0.614						
	24-27	148	3.61	0.691	Inside the Group	459.77	1225	0.375		
	27 and older	345	3.66	0.635	Total	461.56	1228			
Learnability	18-20	473	3.57	0.575	Between the Groups	1.53	3	0.512	1.52	0.206
	21-23	263	3.65	0.546						
	24-27	148	3.62	0.634	Inside the Group	410.45	1225	0.335		
	27 and older	345	3.56	0.581	Total	411.99	1228			
Helping	18-20	473	3.58	0.538	Between	3.34	3	1.11	3.30	0.020*

	21-23	263	3.57	0.569	the Groups					
	24-27	148	3.65	0.660	Inside the Group	412.72	1225	0.337		
	27 and older	345	3.69	0.606	Total	416.06	1228			
Appearance	18-20	473	3.47	0.557	Between the Groups	3.59	3	1.19	3.35	0.018*
	21-23	263	3.48	0.548						
	24-27	148	3.50	0.705	Inside the Group	437.82	1225	0.357		
	27 and older	345	3.60	0.636	Total	441.42	1228			
Effectiveness	18-20	473	3.53	0.451	Between the Groups	1.67	3	0.557	2.25	0.080
	21-23	263	3.55	0.498						
	24-27	148	3.62	0.568	Inside the Group	302.65	1225	0.247		
	27 and older	345	3.61	0.521	Total	304.32	1228			
Satisfaction	18-20	473	3.51	0.573	Between the Groups	7.94	3	2.64	7.29	0.000*
	21-23	263	3.53	0.624						
	24-27	148	3.67	0.595	Inside the Group	444.58	1225	0.363		
	27 and older	345	3.69	0.627	Total	452.33	1228			

P<0.05 \*A significant difference exists

As a result of the ANOVA test conducted, a significant difference on P<0.05 confidence level is observed regarding the helping factor, appearance factor and satisfaction factor. In order to deduce which groups are the source of this difference, an LSD test is carried out, whose results are shown below:

**Table 10: LSD Test Results Regarding the Helping Factor According to the Students' Age Groups**

				Average Difference	P
Helping	Age Group	27 and older	18-20	0.112	0.006
		27 and older	21-23	0.120	0.011

LSD test indicated that, it is observed that students belonging to the age group of 27 and older find the website's helping features significantly stronger at P<0.05 level than the students in the age group of 18-20 (Avg. Diff.=0.112, P=0.006) and students at the ages of 21-23 do (Avg. Diff.=0.120, P=0.011).

**Table 11: LSD Test Results Regarding the Appearance Factor According to the Students' Age Groups**

				Average Difference	P
Appearance	Age Group	27 and older	18-20	0.126	0.003
		27 and older	21-23	0.117	0.016

LSD test revealed that, it is observed that students belonging to the age group of 27 and older are significantly more content with the website's appearance at P<0.05 level than the students in the age group of 18-20 (Avg. Diff.=0.126, P=0.003) and students at the ages of 21-23 are (Avg. Diff.=0.117, P=0.016).

**Table 12: LSD Test Results Regarding the Satisfaction Factor According to the Students' Age Groups**

				Average Difference	P
Satisfaction	Age Group	24-26	18-20	0.159	0.005
		24-26	21-23	0.138	0.026
		27 and older	18-20	0.175	0.000
		27 and older	21-23	0.154	0.002

LSD test stated that, it is observed that students belonging to the age group of 24-26 are significantly more content with the website's general features at P<0.05 level than the students in the age group of 18-20 (Avg.

Diff.=0.159, P=0.005) and students at the ages of 21-23 are (Avg. Diff.=0.138, P=0.026). On the other hand, it is also observed that student who are 27 or older are significantly more content with the website's appearance at P<0.05 level than the students in the age group of 18-20 (Avg. Diff.=0.175, P=0.000) and students at the ages of 21-23 are (Avg. Diff.=0.154, P=0.002).

**Table 13: Factor Based Results of the Variance Analysis Regarding the Students' Departments and Their Opinions on the Distance Education Website's Usability**

Factors	Age Group	N	$\bar{X}$	Ss		Sum of Squares	Sd	Average of Squares	F	P
Controllability	Indust. Elec.	202	3.71	0.573	Between the Groups	5.18	4	1.29	3.47	0.008*
	Comp. Prog.	300	3.60	0.545						
	Info. Mgmt.	229	3.67	0.609	Inside the Group	456.38	1224	0.373		
	Mechatronics	243	3.53	0.709						
	Bus. Mgmt.	255	3.55	0.611						
Learnability	Indust. Elec.	202	3.65	0.527	Between the Groups	5.14	4	1.28	3.87	0.004*
	Comp. Prog.	300	3.65	0.520						
	Info. Mgmt.	229	3.64	0.618	Inside the Group	406.84	1224	0.332		
	Mechatronics	243	3.49	0.640						
	Bus. Mgmt.	255	3.54	0.572						
Helping	Indust. Elec.	202	3.75	0.574	Between the Groups	4.77	4	1.19	3.54	0.007*
	Comp. Prog.	300	3.56	0.549						
	Info. Mgmt.	229	3.62	0.583	Inside the Group	411.29	1224	0.336		
	Mechatronics	243	3.61	0.657						
	Bus. Mgmt.	255	3.59	0.533						
Appearance	Indust. Elec.	202	3.60	0.628	Between the Groups	5.34	4	1.33	3.75	0.005*
	Comp. Prog.	300	3.51	0.541						
	Info. Mgmt.	229	3.59	0.578	Inside the Group	436.07	1224	0.356		
	Mechatronics	243	3.46	0.677						
	Bus. Mgmt.	255	3.43	0.566						
Effectiveness	Indust. Elec.	202	3.60	0.506	Between the Groups	0.522	4	0.131	0.526	0.716
	Comp. Prog.	300	3.58	0.462						
	Info. Mgmt.	229	3.57	0.517	Inside the Group	303.79	1224	0.248		
	Mechatronics	243	3.54	0.546						
	Bus. Mgmt.	255	3.55	0.463						
Satisfaction	Indust. Elec.	202	3.71	0.608	Between the Groups	5.23	4	1.30	3.57	0.007*
	Comp. Prog.	300	3.54	0.550						
	Info. Mgmt.	229	3.61	0.635	Inside the Group	447.30	1224	0.365		
	Mechatronics	243	3.58	0.676						
	Bus. Mgmt.	255	3.52	0.557						

P<0.05 \*A significant difference exists

As a result of the ANOVA test conducted, a significant difference on P<0.05 confidence level is observed regarding the controllability factor, learnability factor, helping factor, appearance factor and satisfaction factor. In order to deduce which groups are the source of this difference, an LSD test is carried out, whose results are shown below:

**Table 14: LSD Test Results Regarding the Controllability Factor According to the Students' Departments**

				Average Difference	P
Controllability	Department	Industrial Elctr.	Mechatronics	0.177	0.002
		Industrial Elctr.	Bus. Mgmt.	0.156	0.007
		Info. Mgmt.	Mechatronics	0.139	0.013
		Info. Mgmt.	Bus. Mgmt.	0.117	0.034

As a result of the LSD test, it is observed that students at the Industrial Electronics Department are significantly more content with the website's controllability characteristics at P<0.05 level than the students of the Mechatronics Department (Avg. Diff.=0.177, P=0.002) and the Business Management Department do (Avg. Diff.=0.156, P=0.007). On the other hand, it is also observed that students at the Information Management Department are significantly more content with the website's controllability characteristics at

$P < 0.05$  level than the students of the Mechatronics Department (Avg. Diff.=0.139,  $P=0.013$ ) and the Business Management Department are (Avg. Diff.=0.117,  $P=0.034$ ).

**Table 15: LSD Test Results Regarding the Learnability Factor According to the Students' Departments**

				Average Difference	P
Learnability	Department	Industrial Elctr.	Mechatronics	0.155	0.005
		Industrial Elctr.	Bus. Mgmt.	0.108	0.047
		Computer Prog.	Mechatronics	0.155	0.002
		Computer Prog.	Bus. Mgmt.	0.108	0.028
		Info. Mgmt.	Mechatronics	0.144	0.006

LSD test revealed that, it is observed that students at the Industrial Electronics Department find the website's learnability significantly higher at  $P < 0.05$  level than the students of the Mechatronics Department (Avg. Diff.=0.155,  $P=0.005$ ) and the Business Management Department do (Avg. Diff.=0.108,  $P=0.047$ ). On the other hand, it is also observed that students at the Computer Programming Department find the website's learnability significantly higher at  $P < 0.05$  level than the students of the Mechatronics Department (Avg. Diff.=0.155,  $P=0.002$ ) and the Business Management Department do (Avg. Diff.=0.108,  $P=0.028$ ). Lastly, students at the Information Management Department find the website's learnability significantly higher at  $P < 0.05$  level than the students of the Mechatronics Department do (Avg. Diff.=0.144,  $P=0.006$ ).

**Table 16: LSD Test Results Regarding the Helping Factor According to the Students' Departments**

				Average Difference	P
Helping	Department	Industrial Elctr.	Computer Prog.	0.190	0.000
		Industrial Elctr.	Info. Mgmt.	0.127	0.023
		Industrial Elctr.	Mechatronics	0.138	0.012
		Industrial Elctr.	Bus. Mgmt.	0.161	0.003

LSD test stated that, it is observed that students at the Industrial Electronics Department find the website significantly more helping at  $P < 0.05$  level than the students of the Computer Programming Department (Avg. Diff.=0.190,  $P=0.000$ ), Information Management Department (Avg. Diff.=0.127,  $P=0.023$ ), Mechatronics Department (Avg. Diff.=0.138,  $P=0.012$ ) and the Business Management Department do (Avg. Diff.=0.161,  $P=0.003$ ).

**Table 17: LSD Test Results Regarding the Appearance Factor According to the Students' Departments**

				Average Difference	P
Appearance	Department	Industrial Elctr.	Mechatronics	0.143	0.012
		Industrial Elctr.	Bus. Mgmt.	0.168	0.003
		Info. Mgmt.	Mechatronics	0.133	0.016
		Info. Mgmt.	Bus. Mgmt.	0.157	0.004

LSD test stated that, it is observed that students at the Industrial Electronics Department are significantly more pleased with the website's appearance at  $P < 0.05$  level than the students of the Mechatronics Department (Avg. Diff.=0.143,  $P=0.012$ ) and the Business Management Department are (Avg. Diff.=0.168,  $P=0.003$ ). Furthermore, it can be stated that students at the Information Management Electronics Department are significantly more pleased with the website's appearance at  $P < 0.05$  level than the students at the Mechatronics Department (Avg. Diff.=0.133,  $P=0.016$ ) and the Business Management Department are (Avg. Diff.=0.157,  $P=0.004$ ).

**Table 18: LSD Test Results Regarding the Satisfaction Factor According to the Students' Departments**

				Average Difference	P
Satisfaction	Department	Industrial Elctr.	Computer Prog.	0.175	0.001
		Industrial Elctr.	Info. Mgmt.	0.133	0.021
		Industrial Elctr.	Mechatronics	0.195	0.001

LSD test stated that, it is observed that students at the Industrial Electronics Department are significantly more content with the website in general at  $P < 0.05$  level than the students of the Computer Programming Department (Avg. Diff.=0.175,  $P=0.001$ ), the Information Management Department are (Avg. Diff.=0.133,  $P=0.021$ ) and the Mechatronics Department do (Avg. Diff.=0.195,  $P=0.001$ ).

**Table 19: Factor Based Results of the Variance Analysis Regarding the Students' Geographic Region of Living and Their Opinions on the Distance Education Website's Usability**

Factors	Age Group	N	$\bar{X}$	Ss		Sum of Squares	Sd	Average of Squares	F	P
Controllability	Mar. Reg.	861	3.59	0.608	Between the Groups	3.93	6	0.655	1.74	0.106
	Aeg. Reg.	125	3.68	0.609						
	Med. Reg.	16	3.30	0.692						
	Ctr. Ant. Reg.	142	3.65	0.601	Inside the Group	457.63	1222	0.374		
	Blk. Sea Reg.	66	3.66	0.649						
	Est. Ant. Reg.	12	3.46	0.628						
	S.Est. Ant. Reg.	7	3.25	0.745						
				Total	461.56	1228				
Learnability	Mar. Reg.	861	3.60	0.570	Between the Groups	3.17	6	0.529	1.58	0.149
	Aeg. Reg.	125	3.64	0.607						
	Med. Reg.	16	3.27	0.822						
	Ctr. Ant. Reg.	142	3.52	0.570	Inside the Group	408.81	1222	0.335		
	Blk. Sea Reg.	66	3.60	0.588						
	Est. Ant. Reg.	12	3.71	0.470						
	S.Est. Ant. Reg.	7	3.42	0.647						
				Total	411.99	1228				
Helping	Mar. Reg.	861	3.61	0.567	Between the Groups	3,52	6	0.587	1.74	0.108
	Aeg. Reg.	125	3.65	0.545						
	Med. Reg.	16	3.26	0.899						
	Ctr. Ant. Reg.	142	3.66	0.608	Inside the Group	412,54	1222	0.338		
	Blk. Sea Reg.	66	3.70	0.641						
	Est. Ant. Reg.	12	3.46	0.764						
	S.Est. Ant. Reg.	7	3.40	0.447						
				Total	416,06	1228				
Appearance	Mar. Reg.	861	3.50	0.586	Between the Groups	3,07	6	0.513	1.43	0.119
	Aeg. Reg.	125	3.57	0.633						
	Med. Reg.	16	3.27	0.726						
	Ctr. Ant. Reg.	142	3.52	0.595	Inside the Group	438,34	1222	0.359		
	Blk. Sea Reg.	66	3.65	0.641						
	Est. Ant. Reg.	12	3.56	0.766						
	S.Est. Ant. Reg.	7	3.28	0.445						
				Total	441,42	1228				
Effectiveness	Mar. Reg.	861	3.56	0.492	Between the Groups	2,79	6	0.465	1.88	0.080
	Aeg. Reg.	125	3.62	0.507						
	Med. Reg.	16	3.32	0.558						
	Ctr. Ant. Reg.	142	3.58	0.477	Inside the Group	301,53	1222	0.247		
	Blk. Sea Reg.	66	3.59	0.518						
	Est. Ant. Reg.	12	3.58	0.600						
	S.Est. Ant. Reg.	7	3.13	0.710						
				Total	304,32	1228				
Satisfaction	Mar. Reg.	861	3.58	0.593	Between the Groups	6,06	6	1.01	2.76	0.011*
	Aeg. Reg.	125	3.65	0.617						
	Med. Reg.	16	3.11	0.792						
	Ctr. Ant. Reg.	142	3.58	0.625	Inside the Group	446,46	1222	0.365		
	Blk. Sea Reg.	66	3.66	0.638						
	Est. Ant. Reg.	12	3.84	0.508						
	S.Est. Ant. Reg.	7	3.25	0.559						
				Total	452,53	1228				

P<0.05 \*A significant difference exists

As a result of the ANOVA test conducted, a significant difference on P<0.05 confidence level is observed regarding the satisfaction factor only. In order to deduce which groups are the source of this difference, an LSD test is carried out, whose results are shown below:

**Table 20: LSD Test Results Regarding the Satisfaction Factor According to the Students' Geographic Region of Living**

				Average Difference	P
Satisfaction	Geographic Region	Marmara Reg.	Med. Reg.	0.465	0.002
		Aeg. Reg.	Med. Reg.	0.532	0.001
		Ctr. Ant. Reg.	Med. Reg.	0.471	0.003
		Blk. Sea Reg.	Med. Reg.	0.551	0.001
		Est. Ant. Reg.	Med. Reg.	0.726	0.002

LSD test revealed that, it is observed that students living in Marmara Region (Avg. Diff.=0.465, P=0.002), Aegean Region (Avg. Diff.=0.532, P=0.001), Central Anatolia Region (Avg. Diff.=0.471, P=0.003), Black Sea Region (Avg. Diff.=0.551, P=0.001) and Eastern Anatolia Region (Avg. Diff.=0.726, P=0.002) are significantly more content with the website in general at P<0.05 level than the students living in Mediterranean Region are.

**Table 21: Factor Based Results of the Variance Analysis Regarding the Students' Years of Enrollment at the University and Their Opinions on the Distance Education Website's Usability**

Factors	Age Group	N	$\bar{X}$	Ss		Sum of Squares	Sd	Average of Squares	F	P
Controllability	1 <sup>st</sup> Year	694	3.56	0.610	Between the Groups	5.18	2	2.59	7.26	0.001*
	2 <sup>nd</sup> Year	476	3.65	0.562	Inside the Group	437.60	1226	0.357		
	3 <sup>rd</sup> Year	59	3.84	0.704	Total	442.78	1228			
Learnability	1 <sup>st</sup> Year	694	3.57	0.580	Between the Groups	4.86	2	2.43	7.45	0.001*
	2 <sup>nd</sup> Year	476	3.63	0.544	Inside the Group	399.98	1226	0.326		
	3 <sup>rd</sup> Year	59	3.85	0.665	Total	404.84	1228			
Helping	1 <sup>st</sup> Year	694	3.59	0.583	Between the Groups	4.29	2	2.15	6.51	0.002*
	2 <sup>nd</sup> Year	476	3.67	0.552	Inside the Group	404.34	1226	0.330		
	3 <sup>rd</sup> Year	59	3.83	0.635	Total	408.64	1228			
Appearance	1 <sup>st</sup> Year	694	3.47	0.578	Between the Groups	10.03	2	5.01	14.5	0.000*
	2 <sup>nd</sup> Year	476	3.57	0.580	Inside the Group	422.23	1226	0.344		
	3 <sup>rd</sup> Year	59	3.86	0.725	Total	432.26	1228			
Effectiveness	1 <sup>st</sup> Year	694	3.51	0.504	Between the Groups	7.36	2	3.68	15.4	0.000*
	2 <sup>nd</sup> Year	476	3.64	0.441	Inside the Group	292.60	1226	0.239		
	3 <sup>rd</sup> Year	59	3.78	0.636	Total	299.97	1228			
Satisfaction	1 <sup>st</sup> Year	694	3.53	0.612	Between the Groups	8.37	2	4.18	11.5	0.000*
	2 <sup>nd</sup> Year	476	3.64	0.555	Inside the Group	444.23	1226	0.362		
	3 <sup>rd</sup> Year	59	3.86	0.807	Total	452.61	1228			

P<0.05 \*A significant difference exists

As a result of the ANOVA test conducted, a significant difference on P<0.05 confidence level is observed regarding the controllability factor, learnability factor, helping factor, appearance factor, effectiveness factor and satisfaction factor. In order to deduce which groups are the source of this difference, an LSD test is carried out, whose results are shown below:

**Table 22: LSD Test Results Regarding the Controllability Factor According to the Students' Years of Enrollment at the University**

				Average Difference	P
Controllability	Years in the University	3 <sup>rd</sup> Year	1 <sup>st</sup> Year	0.272	0.001
		3 <sup>rd</sup> Year	2 <sup>nd</sup> Year	0.187	0.023

LSD test stated that, it is observed that students in their 3<sup>rd</sup> year at the university are significantly more content with the website's controllability characteristics at  $P < 0.05$  level than the students in their 1<sup>st</sup> year (Avg. Diff.=0.272,  $P=0.001$ ) and in their 2<sup>nd</sup> year are (Avg. Diff.=0.187,  $P=0.023$ ).

**Table 23: LSD Test Results Regarding the Learnability Factor According to the Students' Years of Enrollment at the University**

				Average Difference	P
Learnability	Years in the University	3 <sup>rd</sup> Year	1 <sup>st</sup> Year	0.280	0.000
		3 <sup>rd</sup> Year	2 <sup>nd</sup> Year	0.214	0.007

LSD test revealed that, it is observed that students in their 3<sup>rd</sup> year at the university find the website's learnability significantly higher at  $P < 0.05$  level than the students in their 1<sup>st</sup> year (Avg. Diff.=0.280,  $P=0.000$ ) and in their 2<sup>nd</sup> year do (Avg. Diff.=0.214,  $P=0.007$ ).

**Table 24: LSD Test Results Regarding the Helping Factor According to the Students' Years of Enrollment at the University**

				Average Difference	P
Helping	Years in the University	3 <sup>rd</sup> Year	1 <sup>st</sup> Year	0.236	0.014
		3 <sup>rd</sup> Year	2 <sup>nd</sup> Year	0.151	0.002

As a result of the LSD test, it is observed that students in their 3<sup>rd</sup> year at the university find the website's helping features significantly better at  $P < 0.05$  level than the students in their 1<sup>st</sup> year (Avg. Diff.=0.236,  $P=0.014$ ) and in their 2<sup>nd</sup> year do (Avg. Diff.=0.151,  $P=0.002$ ).

**Table 25: LSD Test Results Regarding the Appearance Factor According to the Students' Years of Enrollment at the University**

				Average Difference	P
Appearance	Years in the University	3 <sup>rd</sup> Year	1 <sup>st</sup> Year	0.393	0.000
		3 <sup>rd</sup> Year	2 <sup>nd</sup> Year	0.288	0.000
		2 <sup>nd</sup> Year	1 <sup>st</sup> Year	0.105	0.003

LSD test stated that, it is observed that students in their 3<sup>rd</sup> year at the university are significantly more pleased with the website's appearance at  $P < 0.05$  level than the students in their 1<sup>st</sup> year (Avg. Diff.=0.393,  $P=0.000$ ) and in their 2<sup>nd</sup> year are (Avg. Diff.=0.288,  $P=0.000$ ). Also it can be stated that students in their 2<sup>nd</sup> year at the university are significantly more pleased with the website's appearance at  $P < 0.05$  level than the students in their 1<sup>st</sup> year (Avg. Diff.=0.105,  $P=0.003$ ).

**Table 26: LSD Test Results Regarding the Effectiveness Factor According to the Students' Years of Enrollment at the University**

				Average Difference	P
Effectiveness	Years in the University	3 <sup>rd</sup> Year	1 <sup>st</sup> Year	0.273	0.000
		3 <sup>rd</sup> Year	2 <sup>nd</sup> Year	0.145	0.031
		2 <sup>nd</sup> Year	1 <sup>st</sup> Year	0.127	0.000

LSD test revealed that, it is observed that students in their 3<sup>rd</sup> year at the university find the website significantly more effective at  $P < 0.05$  level than the students in their 1<sup>st</sup> year (Avg. Diff.=0.273,  $P=0.000$ ) and in their 2<sup>nd</sup> year do (Avg. Diff.=0.145,  $P=0.031$ ). Also it can be stated that students in their 2<sup>nd</sup> year at the university find the website significantly more effective with the at  $P < 0.05$  level than the students in their 1<sup>st</sup> year do (Avg. Diff.=0.127,  $P=0.000$ ).

**Table 27: LSD Test Results Regarding the Satisfaction Factor According to the Students' Years of Enrollment at the University**

				Average Difference	P
Satisfaction	Years in the University	3 <sup>rd</sup> Year	1 <sup>st</sup> Year	0.334	0.000
		3 <sup>rd</sup> Year	2 <sup>nd</sup> Year	0.219	0.008
		2 <sup>nd</sup> Year	1 <sup>st</sup> Year	0.114	0.001

LSD test stated that, it is observed that students in their 3<sup>rd</sup> year at the university are significantly more content with the website at  $P < 0.05$  level than the students in their 1<sup>st</sup> year (Avg. Diff.=0.334,  $P=0.000$ ) and in their 2<sup>nd</sup> year are (Avg. Diff.=0.219,  $P=0.008$ ). Also it can be stated that students in their 2<sup>nd</sup> year at the university are significantly more content with the website at  $P < 0.05$  level than the students in their 1<sup>st</sup> year are (Avg. Diff.=0.114,  $P=0.001$ ).

## CONCLUSION

The following results have been obtained at the end of the study:

In the 1<sup>st</sup> hypothesis of the study, it is seen that Adapazarı Vocational Two-Year Community College distance education website at least partially possesses usability criteria according to the students' opinions. Also as per the students' reviews, it is found that the website's helping and controlling features are adequate, while its learnability, the students' satisfaction with it, its effectiveness and its appearance are adequate even if not entirely.

In the 2<sup>nd</sup> hypothesis of the study, it is seen that there is a significant difference in opinion regarding Adapazarı Vocational Two-Year Community College distance education website's learnability, helping ability and effectiveness in terms of gender variable. Judging from these differences, it's observed that male students have a more positive apprehension of the learnability, helping and effectiveness features.

In the 3<sup>rd</sup> hypothesis of the study, it is seen that there is a significant difference in opinion regarding Adapazarı Vocational Two-Year Community College distance education website's helping, appearance and satisfying ability in terms of age variable. According to these differences, it's observed that students under the age of 23 view the above mentioned factors about the website negatively compared to the students who are 23 or older.

In the 4<sup>th</sup> hypothesis of the study, it is seen that there is a significant difference in opinion regarding Adapazarı Vocational Two-Year Community College distance education website's helping, appearance and satisfying ability in terms of age variable. According to these differences, it's observed that students under the age of 23 view the above mentioned factors about the website negatively compared to the students who are 23 or older.

In the 5<sup>th</sup> hypothesis of the study, it is seen that there is a significant difference in opinion regarding Adapazarı Vocational Two-Year Community College distance education website's controllability, learnability, helping ability, appearance and satisfying ability in terms of the department variable. According to these differences, it's observed that students enrolling at the Industrial Electronics Department rate the website's controllability significantly more favorably than students of all the other departments. Also, students of the Mechatronics and Business Management Departments are significantly less content with the website's controllability than all the other students.

In the 6<sup>th</sup> hypothesis of the study, it is seen that there is a significant difference in opinion regarding Adapazarı Vocational Two-Year Community College distance education website's contenting ability in terms of the geographic region of living variable. When this difference is analyzed, it is observed that students living in the Mediterranean Region are significantly less content with the website in general than the students living in other geographical regions.

A set of suggestions that can address the implications of these results is listed as follows:

Improvements in Adapazarı Vocational Two-Year Community College distance education website's learnability, satisfaction, effectiveness and appearance factors may lead to an increased usability level for the website.

A further survey can be conducted targeting the reasons of gender based differences. The underlying causes of the negative thoughts of female students about the website's learnability, helping and effectiveness factors can be exposed.

A comparison study regarding the level of expectations of the younger students and the older students about Adapazari Vocational Two-Year Community College distance education website can be carried out. The motive for such a study is the assertion that the internet is a rapidly developing phenomenon leading to younger students being more interested in it and also more occupied with it, which in turn means their expectation about the website are higher.

A survey can be carried out regarding why students enrolling at the Mechatronics and Business Management Departments are dissatisfied with Adapazari Vocational Two-Year Community College distance education website's controllability. The web pages associated with the Industrial Electronics Department and the Mechatronics and Business Management Departments can be compared and contrasted in order to detect possible deficiencies regarding controlling features in the latter group.

The reasons of why students living in the Mediterranean Region are have this very low satisfaction about the website can be searched. In order to increase their satisfaction level, a set of activities targeting to motivate specifically the students from this region can be carried out.

In addition, analysis based on the survey items is in line with the analysis based on the factors. The item based analysis showed that females compared to males, younger students compared to older students, freshmen students compared to senior students, students of Business Management and Mechatronics Departments compared to students in other departments and students living in the Mediterranean Region compared to students living in other regions have rated various items more negatively.

The survey has been applied only on the students enrolled at the distance education program of Sakarya University Adapazari Vocational School of Higher Education. The survey can also be conducted on students enrolled at other distance education programs and that survey can be compared to the results of this study and be assessed for the purpose of enhancing the usability level of distance education websites.

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