

EXAMINING UNIVERSITY STUDENTS' COGNITIVE ABSORPTION LEVELS REGARDING TO WEB AND ITS RELATIONSHIP WITH THE LOCUS OF CONTROL

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ABSTRACT

The current study investigated university students' cognitive absorption levels according to several variables, and presented the relationship between cognitive absorption and locus of control.

This study resorted to a descriptive model. Participants were 374 undergraduate students. The Cognitive Absorption Scale and Locus of Control Scale were used to collect the data. Independent samples t-test, one-way between-groups ANOVA, correlation and regression analyses were used to analyze data. Findings suggested that university students had above average cognitive absorption.

Moreover, the higher the general internal control/personal control was, the lesser the cognitive absorption level. It was plausible to infer that information and communication technologies served as sources of pleasure and curiosity for university students. However, for students with a higher internal locus of control, levels of pleasure and curiosity dropped.

Keywords: Cognitive absorption, locus of control, information and communication technologies, internet use.

INTRODUCTION

Information and communication technologies are becoming more and more widespread in every field of life. In parallel with this common use, various studies have emerged which analyze the interaction between users with possibly different individual, social and psychological characteristics and these technologies on the basis of a number of variables, such as interest, expectation, competency and level of use. The focal point of these studies is to arrive at some conclusions that suggest more effective and efficient use of the technology in different fields regarding certain tasks and purposes.

A number of models and approaches, such as the Technology Acceptance Model and Diffusion of Innovations have been developed to examine human-technology interaction, and existing ones have been updated in parallel with developments in science and technology.

One of the aforementioned approaches is the theory of "Cognitive Absorption" (CA) developed by Agarwal and Karahanna (2000). Agarwal and Karahanna set forth the link between technology use and acceptance and perceptions and expectations in reference to theoretical models, such as the Technology Acceptance Model (Davis, 1989) which aimed to understand and explain individuals' technology use-related behaviors. Agarwal and Karahanna (2000) further state that previous studies conducted on the subject concentrate more on beliefs within attitudes and individual user cases, and less on how these beliefs have come to exist. From this point forward, it can be concluded that it is vital to look into the source and reference point of socio-psychological variables such as interest, attitude and self-efficacy, rather than the acquirement of knowledge and skills, in order to further explain individuals' technology use.

Other elements such as an individual's past experiences, interaction with the environment, and age group shape individual outcomes of the said variables. Thus, the meanings individuals attach to events and phenomena, sources of motivation and perception of what is right and real continuously changes on the basis of these elements, and their interaction with technology differentiates in the context of this changing contextual framework.

CA accepted as a motivation related variable in essence serves as a key to information technology related beliefs in studies on technology use (Agarwal and Karahanna, 2000). This study which was conducted on the basis of the mentioned structure aimed to explore the interaction between CA and the use of information and communication technologies and web technologies for both educational and social purposes. It also looked into the relationship between locus of control considered as a variable that steers concepts such as motivation, attitude, interest and concern on the basis of meanings individuals attach to events and phenomena and CA from the perspective of university students. A review of the relevant literature in Turkey shows that the concept of CA has been handled in only few studies (Usluel and Vural, 2009; Vural, 2007). In addition, there has been no study about the relationship between locus of control and CA sampling in Turkey. Given the situation in Turkey, this study analyzed university students' technology use related behaviors from the point of view of CA and puts forth the relationship between CA and locus of control and serves to contribute to the literature at the national level. The purpose of this study was to analyze university students' levels of CA according to various variables and present the relationship between CA and locus of control.

Review of Literature

The term CA was coined by Agarwal and Karahanna (2000) and said to be based on cognitive and social psychology. It is defined as a "state of deep involvement with software". This theory handles individuals' experiences with their interaction with technology (Usluel and Vural, 2009). Agarwal and Karahanna (2000) state that the theoretical bases of CA have been influenced by three different approaches, namely "absorption" (Tellegen and Atkinson, 1974), "flow" (Csikszentmihalyi, 1990) and "cognitive engagement" (Webster and Ho, 1997). The CA theory is frequently referred to along with the Technology Acceptance Model, which projects and explains predictors of users' behaviors (Liu, Liao and Pratt, 2009) within a certain system (Chandra, Theng, O'Lwin, and Foo, 2009; Lee, Yoon and Lee, 2009; Saade and Bahli, 2005; Zhang, Li and Sun, 2006). The CA theory constitutes a structure of five different dimensions (Agarwal and Karahanna, 2000; Usluel and Vural, 2009).

The first of these dimensions is time, which translates into not being able to control time when interacting with software or technology in general. Another dimension of CA is focusing of attention, which means an individual's focusing merely on the actual experience without any attention to other stimuli.

Other dimensions are pleasure experienced during interaction, the feeling of being in control of over what happens during interaction and curiosity that drives an individual on a sensorial and cognitive basis to continue with the actual experience or extend it. Agarwal and Karahanna (2000) relate the concept of CA to two main dimensions, namely perceived usefulness (PU) and perceived ease of use (PEU) of the Technology Acceptance Model.

It is also related to positive attitude and exploration driven use of technology as much as it is to PU and PUE (Scott and Walczak, 2009). Similarly, Zhang, Li and Sun (2006) mention the role of CA on cognitive beliefs such as PU and PEU and experientially validate its role in their research.

However, according to the findings of their research, Saade and Bahli (2005) note that CA has a higher variance on PU than on PEU and point to the importance of CA for PU in the web based learning system in higher education. Elmezni and Gharbi (2010) state that CA exerts a strong effect on web users in relation to how they spend their time and the pleasure they derive. In their studies on students' e-learning related acceptance, Lee, Yoon and Lee (2009) present PU as one of the most significant predictors of e-learning usage intentions.

Similarly, another study on the virtual world puts users' trust as an important factor in the development of CA and suggests a significant relationship between CA and user trust. The same study also states that there is a relationship between CA and amusement perceived in use of the virtual world (Chandra, Theng, O'Lwin and Shou-Boon, 2009).

Another variable which affects individuals' experiences while using technology is locus of control, which is described as the "degree to which a person believes in their ability to control events and behavioral results that occur in their lives" (Joo, Joung and Sim, 2011).

According to Akin (2007), locus of control is not a reinforcer on its own; it also involves the beliefs and expectations which control the frequency of an individual's behavior and is concerned with what reinforcers result in.

In terms of locus of control being discussed as two dimensions, those generally being internal and external, it is possible to deduce that – by its definition – it is a variable which determines in which way a person's belief in being in control of events and the results of this belief would work.

A person's having an internal or external locus of control may influence his point of view on events and phenomena and how they behave.

Akin (2007) states that people have more internal locus of control when they succeed and more external locus of control when they fail, and they tend to establish a sensory and cognitive balance based on this.

Joo, Joung and Sim (2011) note that students with internal locus of control have a more positive approach to behavioral results that occur as a result of their own efforts than those with negative control of locus. Locus of control has been subject to quite a few technology based studies. For instance, Chak and Leung (2004) suggest that there is a negative relationship between internet addiction and internal locus of control and people who believe that they can be in control over what happens in their lives are less likely to develop internet addiction. Joo, Joung and Sim(2011) note that locus of control is an important factor for creation of flow during the learning process for cyber learning environments and that internal locus of control and flow influence continuity in the learning of cyber university students. Koo (2009) states that people with an internal locus of control have a lesser tendency to play online games than those with an external locus of control.

The same study suggests that people with an external locus of control like the imaginary power or pleasure they gain while playing online games. Rotsztein (2003) refers to findings which suggest people with an external locus of control have more problematic internet usage. According to a study carried out on social self-efficacy, academic locus of control, and internet addiction, students with low levels of self-efficacy and an internal locus of control are more vulnerable to internet addiction.

METHOD

This study was conducted with a descriptive model. Studies conducted according to this model aim to describe a past or present case as it is (Karasar, 1999).

Study Group

The survey population consisted of a total of 12915 students - 57% females and 43% males-studying at seven different faculties of Trakya University during the 2010-2011 spring semesters.

The sampling of the research was carried out according to the multistage sampling technique. While selecting the sampling of the research, two-stage stratification was performed according to faculty students' attendance and their gender. Stratified sampling ensures both representation of sub-groups of the population in the sampling and a decrease in costs (Balci, 2004, 85).

This study made use of Cochran's (1962; in Balci, 2004, 95) formula, widely used in stratified sampling, to determine the sample size of the research which was 374 according to a .05 confidence level.

Data Gathering Instruments

The *Cognitive Absorption Scale* and *Locus of Control Scale* were used to collect the research data. Personal information forms were also utilized to gather students' personal data. The CA Scale is a 17-item scale first developed by Agarwal and Karahanna (2000) and adapted to Turkish by Usluel and Vural (2009).It is a 1 to 10 Likert type rating scale where 1 refers to "strongly disagree" and 10 to "strongly agree". The Cronbach alpha coefficient for internal consistency was measured to be (α) .92. The CA Scale is made up of four factors, which are "time" [(α) .88], "curiosity" [(α) .90], "pleasure" [(α) .90]and "focusing of attention" [(α) .82]. Scores attained from the scale vary between 17 and 170 (Usluela and Vural, 2009).

Another scale used in the research is Locus of Control Scale developed by Dağ (2002). Out of 47 items of the scale, 22 are reverse scores. It is a 1 to 5 Likert type rating scale where 1 refers to "strongly unfavorable" and 5 to "strongly favorable".

The Cronbach alpha coefficient for internal consistency was measured to be $(\alpha) .92$.

The Locus of Control Scale consists of five factors, which are "general internal control belief/personal control" $[(\alpha) .87]$, "belief in chance" $[(\alpha) .79]$, "meaninglessness of effortfulness" $[(\alpha) .76]$, "belief in fate" $[(\alpha) .74]$ and "belief in an unjust world" $[(\alpha) .61]$. Scores attained from the scale vary between 47 and 235 and the rise in the score reflects the belief in external locus of control (Dağ, 2002).

Data Collection and Analysis

The research data were gathered from students-survey population and sampling of the research – who attended the above mentioned faculties during the 2010-2011 spring term.

After deciding on the departments and classes where the sampling and research data would be collected, the relevant instructors teaching at these departments were contacted and informed about the research. Then the research data were gathered on the set date.

The data collected were computerized and then analyzed by means of SPSS software. t-test and single factor ANOVA were used for independent samplings in the analysis of university students' levels of CA according to various variables and correlation, and regression analyses were used for the analysis of the relationship between university students' levels of CA and locus of control.

FINDINGS

The research first looked into the university students' general levels of CA. Table 1 below presents findings of the analysis performed.

Table: 1
CA levels of the university students

Variable	Item Number (k)	Score Interval	n	\bar{X}	\bar{X} /k	SD
time	5	5-50	374	30.70	6.14	12,863
pleasure	4	4-40	374	26.58	6.64	8,663
curiosity	4	4-40	374	25.60	6.40	9,670
focusing of attention	4	4-40	374	23.78	5.94	8,655
CA	17	17-170	374	106.66	6.27	28,936

According to Table 1, university students attained above average scores for level of CA and each of its sub-dimensions. The order of sub-dimensions that constituted CA as a result of the average scores' being divided by the number of items was (1) *pleasure*, (2) *curiosity*, (3) *time* and (4) *focusing of attention*. The research then compared university students' levels of CA and sub-dimensions to the gender variable. Table 2 shows the results of the t-test conducted for independent samples in this framework.

Table: 2
CA scores according to the gender variable

Variable	Group	n	\bar{X}	SD	t	df	p<
time	Female	214	30.93	12.42	.40	372	.685
	Male	160	30.39	13.46			
focusing of attention	Female	214	23.06	8.61	-	372	.060
	Male	160	24.76	8.64	1.88		
curiosity	Female	214	25.81	8.46	-	372	.047
	Male	160	27.61	8.84	1.99		
pleasure	Female	214	24.36	9.62	-	372	.004
	Male	160	27.25	9.50	2.88		
CA	Female	214	104.16	28.27	-	372	.053
	Male	160	110.01	29.56	1.93		

p<.05

According to Table: 2, there was no significant difference between university students' levels of CA in terms of the sub-dimensions of *time* and *focusing of attention* and the gender variable.

Table: 3
CA levels according to the faculty they attend

Variable		Intra-group	df	MS	F	p<
time		Total	6	156.696	.946	.462
	Intra-group	60778.284	367	165.608		
	Total	61718.460	373			
focusing of attention	Inter-group	992.777	6	165.463	2.253	.038
	Intra-group	26948.680	367	73.430		
	Total	27941.457	373			
pleasure	Inter-group	1332.114	6	222.019	3.056	.006
	Intra-group	26658.816	367	72.640		
	Total	27990.930	373			
curiosity	Inter-group	1168.715	6	194.786	2.121	.050
	Intra-group	33707.319	367	91.846		
	Total	34876.035	373			
CA	Inter-group	9279.775	6	1546.629	1.873	.084
		303027.775	367	825.689		
		312307.551	373			

p<.05

On the other hand, there is statistically significant difference between female and male students in the *curiosity* (t=-1.99, p<.047) and *pleasure* (t=-2.88, p<.004) sub-dimensions. Mean scores of the male students seem to be higher than those of female students for both sub-dimensions.

Another variable used in the research to determine university students' levels of CA is the faculty these students attend. Table: 3 presents results of the single factor ANOVA test.

According to Table: 3, there was no significant difference between university students' levels of CA and the faculty they attend ($p < .05$). However, there was a significant difference between the faculty and sub-dimensions of *focusing of attention* ($F_{(6,367)} = 2,253$, $p < .038$), *pleasure* ($F_{(6,367)} = 3,056$, $p < .006$) and *curiosity* ($F_{(6,367)} = 2,121$, $p < .050$). Since the variances were not equal, Tamhane's T2 multiple comparison test was used in order to determine the source of the difference. As a result of the test, it was concluded that the level of significance in the *curiosity* and *pleasure* sub-dimensions as a result of the single factor ANOVA test did not represent a real significant difference. The difference derived from the ANOVA test may be attributed to non-equal variances. In the sub-dimension of *focusing of attention*, a difference in terms of faculty was found in the Faculty of Science ($\bar{X} = 21.13$) and Faculty of Literature ($\bar{X} = 26.44$).

The research compared university students' levels of CA and its sub-dimensions to the frequency of internet use. Table 4 demonstrates results of the single factor ANOVA test carried out within this framework.

Table: 4
CA levels' according to frequency of internet use

Variable	Source of the variance	SS	df	MS	F
time	Inter-group	494.870	2	247.435	1.499
	Intra-group	61223.590	371	165.023	
	Total	61718.460	373		
focusing of attention	Inter-group	73.189	2	36.595	.487
	Intra-group	27868.268	371	75.117	
	Total	27941.457	373		
curiosity	Inter-group	288.100	2	144.050	1.545
	Intra-group	34587.934	371	93.229	
	Total	34876.035	373		
pleasure	Inter-group	386.914	2	193.457	2.600
	Intra-group	27604.017	371	74.404	
	Total	27990.930	373		
CA	Inter-group	2561.908	2	1280.954	1.534
	Intra-group	309745.643	371	834.894	
	Total	312307.551	373		

$p < .05$

According to Table: 4, there was no significant difference between university students' levels of CA in terms of the sub-dimensions and the frequency of internet use.

The research compared university students' levels of CA and the sub-dimensions to their use of user accounts with social networking sites. Table 5 shows results of the independent samples t-test conducted for in this framework.

Table: 5
CA levels with having user account with social networking sites

Variable	Group	N	\bar{X}	SD	t	df	p<
time	Yes	330	31.25	12.626	2.256	372	.025
	No	44	26.61	14.010			
focusing of attention	Yes	330	23.42	8.567	-	372	.026
	No	44	26.50	8.927			
curiosity	Yes	330	25.84	9.555	1.350	372	.178
	No	44	23.75	10.422			
pleasure	Yes	330	27.05	8.609	2.893	372	.004
	No	44	23.07	8.337			
CA	Yes	330	107.56	28.769	1.646	372	.101
	No	44	99.93	29.632			

p<.05

According to Table 5, there was no significant difference between students' levels of CA in terms of the *curiosity* sub-dimension and their having or not having a user account with social networking sites. However, there is a significant difference in the *time* (t=2,256, p<.025), *focusing of attention* (t=-2,228, p<.026) and *pleasure* (t=2,893, p<.004) sub-dimensions. While students with user accounts with social networking sites attained a higher mean score in terms of *time* and *pleasure*, students without a user account with such sites attained a higher mean score in terms of *focusing of attention*. The research analyzed whether there was any relationship between university students' levels of CA together with the sub-dimensions and locus of control and the sub-dimensions. Table 6 presents the findings of the correlation analysis conducted within this framework.

Table: 6
The relationship between CA and locus of control

	CA	general internal control belief/personal control	external locus of control
general internal control belief/personal control	-.201**	-	-
external locus of control	.061	.187**	-
Locus of control	-.087	.755**	.785**

** Correlation is significant at the .01 level (2-tailed).

The above mentioned analysis did not suggest any statistical relationship between CA and locus of control and *external locus of control*. However, it presented a negative and low level of relationship between CA and *general internal control belief/personal control*. The simple linear regression analysis looked into whether *general internal control belief/personal control* variable is one of the variables which predicts CA.

According to results, *general internal control belief/personal control* variable was one of the variables which predicted CA and explained 4% of the total variance [$R=0.201$, $R^2=0.041$, $F=15.720$, $p<.01$].

The research also looked into the relationship between CA sub-dimensions and the *general internal control belief/personal control* variable. Table 7 presents the findings of correlation analysis conducted within this framework.

Table: 7
Relationship between CA's sub-dimensions and general internal control belief/personal control

	general internal control belief/personal control	time	focusing of attention	pleasure
time	-.109*	-	-	-
focusing of attention	-.122*	.189**	-	-
pleasure	-.194**	.492**	.301**	-
curiosity	-.175**	.299**	.305**	.634**

* Correlation is significant at the .05 level (2-tailed), ** Correlation is significant at the .01 level (2-tailed)

Findings of the correlation analysis suggested a negative and low level of relationship between *general internal control belief/personal control* variable and each sub-dimension for CA. According to correlation coefficients of the analysis, the order of the said relationship is (1) *pleasure* ($r=-.194$; $p=.01$), (2) *curiosity* ($r=-.175$; $p=.01$), (3) *focusing of attention* ($r=-.122$; $p=.05$) and (4) *time* ($r=-.109$; $p=.05$).

DISCUSSION

This study analyzed university students' levels of CA according to a number of variables and looked into the relationship between CA and locus of control. The research primarily examined university students' levels of CA on the basis of a number of variables. Given the findings, it is possible to say that students have over moderate level of CA. Considering the average scores, sub-dimensions of the CA are seen to be ranked in the order of *pleasure*, *curiosity*, *time* and *focusing of attention*. A study conducted by Vural (2007) suggested similar results where CA levels of candidate teachers turned out to be high and the order of relevant sub-dimensions was found to be *time*, *pleasure*, *curiosity* and *focusing of attention*. Another study conducted by Elmezni and Gharbi (2010) shows that CA exerts a strong effect on web users in relation to how they spend their time and derive pleasure. Another study states that there is a relationship between CA and amusement perceived in the use of the virtual world (Chandra, Theng, O'Lwin, and Foo, 2009). Accordingly, it is possible to conclude that Web use leads to a rise in their levels of CA by stirring university students' feelings of pleasure and curiosity.

There was no statistically significant difference in comparisons of variables having been subject to the sub-purposes of the research and total CA scores. However, some factors listed as sub-dimensions of the CA could present statistically significant differences according to certain variables handled. The gender variable stands out as one of these, and there is a significant relationship between the gender variable and the two sub-dimensions, namely pleasure and curiosity. Male students attained higher scores in both sub-dimensions.

In other words, it is possible to say that male students take more pleasure in web use and their levels of curiosity are higher compared to female students. Some research in the relevant literature states that males could be more active than females in their experiences with information and communication technologies. For instance, Ceyhan (2008) notes that males have more difficulty than females with problematic internet usage, and Gündüz and Özdiç (2008) suggest that males have higher perception levels of self-efficacy while using the internet.

Considering the social environment and characteristics imposed by social roles affected by gender, it is possible to conclude that males have easier access to technology regardless of time and space, thus have the opportunity to gain more experience in technology use.

Thus, findings of the research support those of similar research. However, a study carried out by Vural (2007) did not suggest a statistically significant difference in the CA's sub-dimensions according to candidate teachers' genders. This finding is likely to have resulted from characteristics of samples in both studies. As the number of studies conducted in Turkey on university students' CA will increase, it will be easier to generalize the relationship between the said variables and this concept.

There emerged a significant difference between faculty students' attendance and the focusing of attention sub-dimension. The study conducted by Vural (2007) did not suggest a significant difference between CA's sub-dimensions and the departments at which the candidate teachers studied.

In this research, the Faculty of Literature's score turned out to be higher than that of the Faculty of Science in terms of focusing of attention. Both faculties are representatives of different scientific fields, and students of these departments receive education based on paradigms in line with the faculties' cognitive contexts.

Thus, areas of interest that students own and have developed within the framework of their social and cognitive characteristics, and their social characteristics and perceptual structures may explain the difference having resulted in focusing of attention.

This research did not suggest any significant difference in students' levels of cognitive absorption with the sub-dimensions according to frequency of internet use. However, Vural's study (2007) put forth a significant difference in teacher candidates' time, curiosity and pleasure sub-dimensions according to their internet use frequency.

According to this research, the longer the duration of use is, the higher the curiosity and pleasure sub-dimensions become. Frequency of use is a variable treated in a number of studies (Cakır Balta and Horzum, 2008; Odacı and Kalkan, 2010) in the literature which suggest that the increase frequency of use might result in problems such as internet addiction or problematic internet use.

Contrary to these studies and findings, this study did not present a significant difference between university students' levels of CA and their frequency of internet use. It is likely to be linked to university students' experiencing a healthier virtual environment due to their positive social interaction with friends and the environment on and off campus, social opportunities, and their personal choices and characteristics.

This study discussed students' having user accounts with social networking sites within the framework of their levels of CA and the sub-dimensions. Though the research did not suggest any significant difference between students' having or not having accounts with such sites and their scores of CA, it presented a statistically significant difference in the time, focusing of attention and pleasure sub-dimensions. Redecker, Ala-Mutka and Punie (2010) state that social networks encourage users to be more active and interactive in internet use. Another study suggests that one of the primary intentions of individuals who use Facebook, being among the popular social networking sites, is to sustain their existing relationships (Mazman and Usluel, 2011).

In the light of similar findings, it is possible to assume that the web environment leads to an increase in the level of CA, as social networking sites offering students the chance to socially interact regardless of time or space and social sharing realized through the use of multimedia elements attract students' attention.

This research looked into the relationship between university students' levels of CA and locus of control. The research, in a general sense, presented a significant but negative relationship between university students' levels of CA and general internal control belief, that is, personal control.

It also analyzed the relationship between the sub-dimensions of CA and internal control belief/personal control and suggested a negative relationship with each sub-dimension, pleasure, curiosity, focusing of attention and time respectively. Accordingly, the more personal control students have, the lower their level of CA.

Some studies which were carried out on the locus of control and the Internet suggested similar findings.

For instance, Chak and Leung (2004) and Rotsztein (2003) state that there is a negative relationship between internet addiction and internal locus of control and Koo (2009) notes that people with an internal locus of control have less tendency to play online games. Çelik, Atak and Başal (2012) state that need for internet use is lower level for extraverted people when compared to other personality types.

Further, Joo, Joung and Sim (2011) state that the internal locus of control has an effect on the continuity of learning for cyber university students. Within the framework of these findings, and as mentioned in similar studies in the literature, it is possible to deduce that having a higher internal locus of control, in other words having a higher level of personal control results in a decrease in the level of CA.

CONCLUSION

The research suggests that university students have over moderate level of CA and the higher the general internal control/personal control is, the lesser CA. It is possible to conclude that information and communication technologies serve as sources of pleasure and curiosity for university students, but for students with a higher internal locus of control, levels of pleasure and curiosity drop.

Use of information and communication technologies in learning and teaching processes and online applications' becoming widespread, as well as e-learning and social networks in particular, have made it important to understand and explain at what levels, how and why users interact with the said technologies.

CA now stands out as a variable which may help to determine university students' technology related perceptions and their sensory and cognitive choices in technology use in online learning applications and in classes supported information and communication technologies. In this context, CA is a concept which may help define students' characteristics in the process of developing technology based teaching practices that will attract students' attention, ensure motivation, and offer individual and social pleasure while learning. However, from the opposing point of view, it should be considered that the relationship between CA and internal locus of control may indicate misuse and the negative impacts of technology.

It is possible to put forth some recommendations within the framework of the findings of the study. First, future studies conducted with different samples to determine university students' levels of CA may contribute to the enrichment of the relevant literature and accordingly technology based teaching practices developed at university level may become more efficient. In addition, research which will cover variables such as locus of control that is likely to be related to CA may help present the link between CA and students' individual and social characteristics and its effect on the use of technology. Using the scales to determine CA levels in the research as the basis of web technology having the potential to be widely used among all information and communication technologies and the population's and sampling's being made up of students of a single university should be acknowledged as limitations of the research. Research carried out with different samples and focused on different technologies may suggest different findings.

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