



The Investigation of the Relationship between Attitudes Towards E-Learning and Self-Directed Learning with Technology of Secondary School Students¹

Research Article

Mehmet EROGLU², Ramazan OZBEK³

²Firat University, Faculty of Education, Elazığ, Turkey ORCID: 0000-0003-1906-5835

³İnönü University, Faculty of Education, Malatya, Turkey ORCID: 0000-0002-6228-1624

To cite this article: Eroglu, M., & Ozbek, R. (2018). The investigation of the relationship between attitudes towards e-learning and self-directed learning with technology of secondary school students, *International Online Journal of Educational Sciences*, 10(5), 297-314

ARTICLE INFO

Article History:

Received: 08.09.2018

Available online:

30.10.2018

ABSTRACT

The purpose of this study is to investigate the relationships between attitudes towards e-learning and self-directed learning with technology of secondary school students. This descriptive study is designed with correlational research methods. The sample of this study is consist of 313 students from 5 different secondary schools in Malatya in Turkey. Data is collected in 2015- 2016 academic year through self-directed learning with technology scale for young students and attitude scale towards e-learning. Descriptive statistics, independent sample t-test, one way ANOVA and linear regression analysis is used for data analysis. According to the findings, levels of students' self-directed learning with technology and attitude towards e-learning is slightly higher. Students' self-directed learning with technology and attitude towards e-learning do not differ in terms of gender and purpose of internet use. But students' self-directed learning with technology and attitude towards e-learning differ in terms of students' daily internet use time and frequency of computer/internet use during school lessons. Students' self-directed learning with technology predict students' attitude towards e-learning significantly. %11 of the variance of students' attitude towards e-learning can be explained by students' self-directed learning with technology. The results indicates that frequency of internet use or time both in school lessons and out of school are important factors for students' self-directed learning with technology and attitude towards e-learning. Also students' self-directed learning with technology is one of important predictors of students' attitude towards e-learning. Students' internet and ICT usage should be increased controlledly to increase the level of students' attitude towards e-learning and self-directed learning with technology.

© 2018 IOJES. All rights reserved

Keywords:

Self-directed learning with technology, attitude towards e-learning, correlational research, secondary school students.

¹ This study is presented as an oral presentation at I. International Academic Research Congress (INES) which was held 3-5 November 2016 in Antalya, Turkey.

² Corresponding author's address: Firat University, Faculty of Education, Elazığ, Turkey.

Telephone: +905362989680

e-mail: mehmeteroглу@firat.edu.tr

DOI: <https://doi.org/10.15345/iojes.2018.05.019>

Introduction

Today, there are rapid developments in information technologies. Developments in information technologies affect many fields. Clearly, one of the field that are most affected is education (Al-Musawi, 2014). Because the use of information and internet technologies as teaching and learning tools is now rapidly expanding into education (Demir & Yurdugül, 2014; Liaw, Huang & Chan, 2007). Also technological advancement has led to important changes in the way education is being imparted (Suri & Sharma 2013). Besides, computers and the internet designed for educational purposes have fundamentally changed school education (Liaw & Huang, 2011). Many scholar and practitoners in education agree that Information and Communication Technology (ICT) plays an increasingly important role in facilitating the education (Hunaiyyan et al., 2008). So, the Internet and online learning currently capture public attention recently and define today's popular perceptions of educational technology (Garrison & Anderson 2003).

Electronic learning (e-learning), which is one of the most important products of the development of information technologies in education, is a frequently researched subject (Kisanga & Ireson, 2016; Sun et al., 2008). But today, e-learning is still in an early stage, with many uncertain issues to be clarified and investigated. There are many factors potentially influencing e-learning effectiveness, such as media characteristics, learning context, technology, and learner characteristics (Zhang et al., 2004). Recently, there are direct and indirect result of studies showing that self-directed learning, which have been shown as important skills of the 21st century, may be related to e-learning as a learner characteristic (Song & Hill, 2007; Vonderwell & Turner, 2005). It is important to reveal the relationship between these two concepts, which are increasingly important in the digital age.

E-Learning

Evolution of internet and advancement in computer technology has led to new approaches in learning and training which are referred to as e-learning (Suri & Sharma 2013). E-learning is one of the most popular learning environments in the information age. The origins of the term e-learning most likely originated during the 1980's, within the similar time frame of another delivery mode online learning (Moore et al., 2011). Especially with the advent of the microcomputer in the late 1970s, the quest for e-learning (that is, using a computer to aid in the learning process) at the school level had begun (Paris, 2004). Nowadays, e-learning is a frequently encountered concept and application area in educational technologies.

A multitude of definitions of e-learning already exists in literature (Tavangarian et al., 2004). E-learning can be defined as the use of computer network technology, primarily over an intranet or through the internet, to deliver information and instruction to individuals (Welsh et al., 2003). E-learning can be defined as technology-based learning in which learning materials are delivered electronically to remote learners via a computer network (Zhang et al., 2004). Basically e-learning is the use of telecommunication technology to deliver information for education and training (Sun et al., 2008). E-learning involves the use of computers and internet to aid in the learning process (Gunasekaran et al, 2002; Paris, 2004). E-learning includes instruction delivered via all electronic media including the internet, intranets, extranets, satellite broadcasts, audio/video tape, interactive TV, and CD-ROM. All efforts to implement e-learning will eventually move towards total automation of administrating the teaching and learning processes by means of a software known as Learning Management Systems (LMS) (Govindasamy, 2001). So e-Learning, in particular the use of learning management systems, introduced a new aspect (Link & Marz, 2006). Poulouva and Simonova (2009) define "e-learning" as "a modern way of education, which uses computer technology, computer networks and appropriate applications. Also Rosenberg (2000), emphasize a technological approach to e-learning. They understand it as a tool for designing, updating, distribution and evaluation of the process of instruction, knowledge management run by net technologies and computers with appropriate hardware and software equipment.

E-learning has, over recent years, become ever more popular (Kisanga & Ireson, 2016). With the progress of information and communication technology development, e-learning is emerging as the paradigm of modern education (Sun et al., 2008). Essentially, e-learning is another way of teaching and learning (Govindasamy, 2001). Therefore, the trend of using e-learning as a learning and/or teaching tool is now rapidly expanding into education (Demir & Yurdugül, 2014; Liaw, Huang ve Chan, 2007). But, the success of students in e learning environments depends on many factors. Student characteristics are regarded as a critical success factor in e-learning in developing countries (Bhuasiri, et al., 2012). These characteristics include computer self-efficacy, internet self-efficacy, computer experience, internet experience, computer anxiety, and attitudes toward e-learning (Chiu & Wang, 2008; Chu & Chu, 2010; Fuller et al., 2006; Pituch & Lee, 2006; Shih, Munoz, & Sanchez, 2006; Sun et al., 2008).

Attitudes are held with respect to some aspect of the individual's world, such as another person, a physical object, a behavior, or a policy (Ajzen & Fishbein, 1977). It can be defined a negative or positive tendency and attitudes give direct the behavior of individuals (Ülgen, 1994). Attitudes toward e-learning implies that learners' positive or negative feelings about their participation in e-learning activities (Al-Musawi, 2014). Understanding students' attitudes towards e-learning can help determine the extent to which students utilize the e-learning system in campus and to direct online courses towards the aims of quality assurance in education (Ong & Lai, 2006). Also, it can be useful for predict learning outcomes (Pérez Cereijo, 2006). Student attitudes towards e-learning have been identified as critical to the success of e-learning (Zhang & Bhattacharyya, 2008). Also Student attitudes and beliefs towards e-learning and past e-learning experiences are regarded as success determinants of future e-learning initiatives (Rhema & Miliszewska, 2014).

Self-Directed Learning

Self-directed learning (SDL) has been an influential adult learning concept and extensively researched area within the field of adult education (Caffarella, 1993; Ellinger, 2004; Garrison, 1997; Oddi, 1987; Owen; 2002). 1970s was undoubtedly the period of SDL characterized as it was by a plethora of empirical studies and by the efforts of Knowles (1975) and Tough (1979) to popularize the concept (Brookfield,1985). Knowles regarded SDL as one of the manifestations of andragogy and a vital element in his understanding of contract learning. Underlying the whole idea is the idea that the individual is an autonomous learner (Jarvis, 2004). Self-direction in adult learning has ben refered to "self-directed learning", "self-planned learning," "self-initiated learning", "inquiry method," "independent adult learning," "self-education," "self-instruction/" self-teaching," "self-study," and "autonomous learning." (Knowles, 1975; Owen, 2002). SDL has been characterized as a multifaceted concept (Ellinger, 2004). According to Knowles (1975), in the most-cited definition of the process of SDL (Beavers, 2009; Guglielmino, 2013), "self-directed learning" describes a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes". According to Gibbons (2002) SDL is any increase in knowledge, skill, accomplishment, or personal development that an individual selects and brings about by his or her own efforts using any method in any circumstances at any time. As the term suggests, SDL views learners as responsible owners and managers of their own learning process (Abdullah, 2001). Despite the many different definitions of SDL in the literature, it is common for the individuals to take responsibility for their own learning, to plan learning, to carry out learning and to evaluate learning (Caffarella, 2000; Merriam & Caffarella, 1999).

SDL is promoted as one of the critical skills for 21st Century and the development of SDL skills are much emphasized (Guglielmino, 2008; 2013; Owen, 2002; Rees & Bary, 2006; Smedley, 2007; Timothy et al., 2010; Demir et al.,2014; Rashid & Asghar, 2016; Jaleel & Anuroofa, 2017). Engaging students in SDL develops in them the capacity for educational growth throughout their lives (Bolhuis, 2003). Self-directed learner

diagnoses his or her own learning needs and formulates his or her own learning goals. A self-directed learner plays an active role in his/her learning process, such as planning, monitoring and evaluating the learning process in face-to-face learning contexts (Lee et al., 2014). Students' engagement in SDL depends on their successful experiences of undertaking challenging activities that leads to the development of personal knowledge and skills (Gibbons, 2002). If the self-directed learner is fully functioning, he or she would do this for instrumental, dialogic and SDL, which all are more or less involved in most situations (Mezirow, 1985).

The concept of SDL has been recognized and researched for decades; however, digital revolution has brought it to the forefront and its context has changed with the presence of technology in current learning avenues (Rashid & Asghar, 2016). Technology may have direct impact on SDL because it has greatly facilitated access both to information resources and to online expertise (Timothy et al., 2010). So, SDL is one of important concept and research subject in information age (Owen, 2002).

Self-Directed Learning and E-Learning

In today's fast-paced world, students can access information anywhere and anytime (Jaleel & Anuroofa, 2017). Information technology provides an excellent opportunity for the development of educational methods and paves the way for more effective and less expensive advance methods of instruction (Al-Musawi, 2014). Also ICT provides the appropriate tools for students to manage their learning effectively (Timothy et al., 2010). But there are some features that learners should possess in order to use these opportunities that technology provides. Learning through self-direction can be refined and amplified with the use of technology. Technology can support lifelong, self-directed learning beyond the regular classroom (Jaleel & Anuroofa, 2017). SDL could provide a more direct route into understanding the actual dynamics of and relationships between learning and technologies (Candy, 2004).

E-learning is one of the most popular learning environments in the information age and e-learning environments can offer students self-directed learning opportunities. According to Liaw and Huang (2003), e-learning systems, possess four characteristics. First, e-learning offers a multimedia environment for learners. Second, e-learning system supports interactive communication whereby users have full control over their own learning situations. Third, e-learning supports networking for accessing and sharing information. Fourth, by implementing as a web-based application, e-learning provides a cross-platform environment, which allows e-learning systems to be executed independently on various computer operating systems. Given these characteristics of e-learning environments, learners are expected to have self-directed learning skills and learner can control his/her learning. E-learning requires more maturity and self-discipline from students than traditional classroom education (Zhang et al., 2004). Also SDL views learners as responsible owners and managers of their own learning process (Abdullah, 2001).

According to result of studies on SDL have indicated that the close relationship between SDL and the use of technologies in learning. Also a significant level of agreement about the influence current technology affordances could have on SDL in literature (Rashid & Asghar, 2016; Timothy et al., 2010). For example according Vonderwell and Turner (2005), online learning environment provides more control of the instruction to the learners and thereby could enhance aspects of SDL, in areas such as students taking responsibility and initiative towards their learning. Similarly, Song and Hill (2007) reported that in an online environment, self-directed learners demonstrate control, critical reflection and responsibility. When the characteristics of e-learning environments and related research results are examined, it is thought that there is a possible relationship between e-learning and SDL. This relationship can make significant contributions to the design and implementation of e-learning. In addition, there is no study investigating the relationship between e-learning and SDL in the literature.

The Purpose Of The Research

The purpose of this study is to investigate the relationships between attitudes towards e-learning and self-directed learning with technology of secondary school students. Within this context, answers to the questions below are sought:

1. What is the level of secondary school students' attitudes towards e-learning and self-directed learning with technology?
 - 2.1. Is there a significant difference in secondary school students' attitudes towards e-learning and self-directed learning with technology in terms of gender?
 - 2.2. Is there a significant difference in secondary school students' attitudes towards e-learning and self-directed learning with technology in terms of purpose of internet use?
 - 2.3. Is there a significant difference in secondary school students' attitudes towards e-learning and self-directed learning with technology in terms of students' daily internet use time?
 - 2.4. Is there a significant difference in secondary school students' attitudes towards e-learning and self-directed learning with technology in terms of frequency of computer and internet use during school lessons?
3. Do self-directed learning with technology of secondary school students predict the attitudes towards e-learning?

Method

The Research Design

This descriptive study is designed with correlational research methods. Correlational models are models in which relationships between two or more variables are examined without any effect on variables (Fraenkel, Wallen, & Hyun, 2015).

Sample

The sample of this study is consist of 313 students from 5 different secondary schools in Malatya in Turkey. One of these schools private school, others public schools. 155 of the students (49 %) were female and 158 (51%) were male.

Measures

Data is collected through a questionnaire form including demographic information related to participants, self-directed learning with technology scale for young students and attitude scale towards e-learning.

Self-directed learning with technology scale for young students: Self-directed learning with technology for young students scale which was developed by Teo, Tan, Lee, Chai and Koh (2010), adapted to Turkish Demir and Yurdugül (2013) was prepared five likert type, consist of 6 items and 2 factors which were named self-management and intentional learning. Study group of the validity and reliability research consisted of 1051 primary and secondary school students. According to Demir and Yurdugül (2013), the scale, in total, explained 59,316% of the variance of self-directed learning construct. Self-management factor accounts for 16,758% of the variance and intentional learning accounts for 42,874 % of the variance. Factor loads of items in the scale were found to vary between .852 and .642. The values of goodness of fit indices ($\chi^2/sd=9.49$, RMSEA=.90, CFI=.95) were sufficient to proceed. Cronbach alpha internal consistency coefficient of the scale was calculated to be .729, reliability of the self-management and intentional learning factors were calculated to be .528 and .729 respectively. Also cronbach's alpha alpha internal consistency coefficient is calculated .624 for whole scale in this study.

Attitude scale towards e-learning: Attitude scale towards e-learning which was developed by Haznedar and Baran (2012) was prepared five likert type. Study group of the validity and reliability research consisted of 567 university students. According to Haznedar and Baran (2012), factors analysis which was conducted for 20 item, displayed that this attitude scale can be used both with single factor and two factors. Single factor of the general attitude towards e-learning scale explained 45.12% of the total variance. Two factors scale explained 52.23% of the total variance. Cronbach's Alpha internal consistency coefficient is 0.93 for single factor scale. Single factor version of the scale is used and cronbach's alpha internal consistency coefficient for the scale is calculated .902 in this study.

Data Collection

A questionnaire including demographic information form related to participants and scales are applied to 400 students by researchers in 2015- 2016 academic year. 366 questionnaires of 400 questionnaires were answered by the students.

Data Analysis

The collected data is transferred to the computer after checking and making necessary arrangements. Since the internet is important for e-learning, 53 participants who do not use the internet are excluded from the analysis. Therefore, 313 questionnaire forms are included in the analysis. Using parametric statistical tests in analysis of research is a desirable situation in terms of generalizability and reliability of results (Can, 2013). But some preconditions (normal distribution, linearity, etc) must be met in order to use parametric statistical tests. For this reason, the data is organized by checking descriptive statistics such as standard deviation, mean, mode, median, skewness, kurtosis and z scores to ensure normality of the data obtained in the study (Can, 2013). In this procedure performed for the data, -3, +3 interval is taken as the criterion for z value. Central tendency values (mean, mode, median) calculated for scales and it is seen the values are close to each other. Also skewness and kurtosis values are in the range of -1 +1. Normal distribution of the data is observed according to these criterion.

Descriptive statistic such as mean, percentage is used to determine demographic features of the students and students' level of attitude towards e-learning and self-directed learning with technology. independent sample t-test is used to determine whether students' attitude towards e-learning and self directed learning with technology differ in terms of gender and purpose of using internet. One-way analysis of variance (ANOVA) is used to determine whether students' attitude towards e-learning and self-directed learning with technology differ in terms of students' daily internet use time, frequency of computer and internet use during school lessons. Scheffe test is used to determine differences between groups. Linear regression analysis is used to determine whether students' self-directed learning with technology predict students' attitude towards e-learning significantly.

Findings

In this section, level of students' attitude towards e-learning and self-directed learning with technology is determined. Also students' attitude towards e-learning and self-directed learning with technology are compared separately in terms of gender, purpose of internet use, daily internet use time, frequency of computer and internet use during school lessons. It is determined whether students' self-directed learning with technology predict students' attitude towards e-learning significantly.

Level of Students' Attitude towards E-Learning and Self-Directed Learning with Technology

Table 1 indicates the means and standard deviations related to level of students' attitude towards e-learning and self-directed learning with technology.

Table 1. Descriptives statistic related to students' attitude towards e-learning and self-directed learning with technology

Scales	N	M	SD
Attitude Toward e-learning	313	3.25	0.79
Self-Directed Learning with Technology	313	3.27	0.79
Self Management	313	3.60	0.75
Intentional Learning	313	2.61	0.95

The mean of students related to attitude towards e-learning is 3,25; the mean related to self management is 3,60; and the mean related to intentional learning is 2,61; the mean related to the whole of the self-directed learning with technology is 3,27.

Students' Attitude towards E-Learning and Self-Directed Learning with Technology in terms of Gender

Independent sample t-test is used to determine whether the students' attitude towards e-learning and self-directed learning with technology differ in terms of gender. The results of independent sample t-test are indicated in table 2.

Table 2. t test result related to students' attitude towards e-learning and self-directed learning with technology in terms of gender

Variables	Gender	N	M	SD	t	p
Attitude Toward e-learning	Female	155	3.26	0.79	1.420	.177
	Male	158	3.24	0.75		
Self-Directed Learning with Technology	Female	155	3.28	0.79	1.473	.132
	Male	158	3.26	0.71		

* $p < .05$

As seen in table 2, It is seen that students' attitude towards e-learning ($p > .05$, $t = 1,420$) and self-directed learning with technology ($p > .05$, $t = 1,473$) do not differ in terms of gender.

Students' Attitude towards E-Learning and Self-Directed Learning with Technology in terms of Purpose of Internet Use

Independent sample t-test is used to determine whether students' attitude towards e-learning and self-directed learning with technology differ in terms of purpose of internet use. The results of independent sample t-test are indicated in table 3.

Table 3. t test results related to students' attitude towards e-learning and self-directed learning with technology in terms of purpose of internet use

Variables	Purpose of internet use	N	M	SD	t	p
Attitude Toward e-learning	Educational	142	3.27	0.68	1.246	.136
	Non educational	171	3.24	0.74		
Self Directed Learning with Technology	Educational	142	3.29	0.69	1.543	.121
	Non educational	171	3.26	0.77		

* $p < .05$

It is seen that students' attitude towards e-learning ($p > .05$, $t = 1,246$) and self-directed learning with technology ($p > .05$, $t = 1,543$) do not differ in terms of purpose of internet use.

Students' Attitude towards E-Learning and Self-Directed Learning with Technology in terms of Internet Use Time

One-way ANOVA is used to compare whether the students' attitude towards e-learning and self-directed learning with technology differentiate in terms of students' daily internet use time and the results are indicated in table 4, table 5.

Table 4. One way ANOVA results related to students' attitude towards e-learning in terms of daily internet use time.

Scale		Sum of square	df	Mean square	F	p	Differential Groups
Attitude toward e-learning	Between groups	5.350	2	2.675	5,188	0,06*	3-1
	Within groups	159.863	310	0.516			
	Total	165.214	312				

* $p < .05$

It is seen that It is found statistically significant differences students' attitude towards e-learning in terms of students' daily internet use time ($F= 5.188$; $p < .05$). Scheffe test is used to determine differences between groups. According to Scheffe test results, attitude towards e-learning of students who use internet higher than 4 hour in a day ($M=3.52$), are higher than students who use internet lower than 1 hour in a day ($M=3.13$).

Table 5. One way ANOVA results related to students' self-directed learning with technology in terms of daily internet use time.

Scale		Sum of square	df	Mean square	F	p	Differential Groups
Self directed learning with technology	Between groups	4.321	2	2.160	4,089	0,18*	3-1
	Within groups	162.755	310	0.528			
	Total	167.076	312				

* $p < .05$

It is seen that It is found statistically significant differences students' self-directed learning with technology in terms of students' daily internet use time ($F= 4.089$; $p < .05$). Scheffe test is used to determine differences between groups. According to Scheffe test results, self-directed learning with technology of students who use internet higher than 4 hour in a day ($M=3.48$) are higher than students who use internet lower than 1 hour in a day ($M=3.15$).

Students' Attitude towards E-Learning and Self-Directed Learning with Technology in terms of Frequency of Internet/ Computer Use During School Lessons

One-way ANOVA is used to compare whether the students' attitude towards e-learning and self-directed learning with technology differ in terms of frequency of internet/computer use during school lessons. The results are indicated in Table 6 and Table 7.

Table 6. One way ANOVA results related to students' attitude towards e-learning in terms of frequency of internet/ computer use during school lessons.

Scale		Sum of square	df	Mean square	F	p	Differential Groups
Attitude toward e-learning	Between groups	8.158	4	2.040	4,000	0,04*	4-2
	Within groups	157.056	308	0.510			
	Total	165.214	312				

* $p < .05$

It is seen that It is found statistically significant differences in students' attitude towards e-learning in terms of frequency of internet/computer use during school lessons ($F= 4.000$; $p < .05$). Scheffe test is used to determine differences between groups. According to Scheffe test results, attitude towards e-learning of

students who usually use internet/ computer during school lessons ($M=3.57$) are higher than students who rarely use computer/internet during school lessons ($M=3.05$).

Table 7. One way ANOVA results related to students' self-directed learning with technology in terms of frequency of internet/computer use during school lessons.

Scale		Sum of square	df	Mean square	F	p	Differential Groups
Self directed learning with technology	Between groups	6.278	4	1.570	2,987	0,19*	4-2
	Within groups	160.798	308	0.525			
	Total	167.076	312				

It is seen that it is found statistically significant differences students' self-directed learning with technology in terms of frequency of internet/computer use during school lessons. ($F= 2.987$; $p<.05$). Scheffe test is used to determine differences between groups. According to Scheffe test results, self-directed learning with technology of students who usually use internet/computer during school lessons ($M=3.58$) are higher than students who rarely use internet/computer during school lessons ($M=3.16$).

The Relationship between Attitude towards E-Learning and Self-Directed Learning with Technology

Firstly, correlation coefficients are calculated through Pearson Product Moment analysis to determine the relationship between self-directed learning with technology and attitudes towards e-learning. The scattering diagram is examined to determine whether this relationship is linear and it is observed that there is a positive linear relationship. Then linear regression analysis is performed to determine the relationship between the attitude towards e-learning and self directed learning with technolog of secondary school student. The results of linear regression analysis are indicated in table 8.

Table 8. Linear regression analysis results related to students' attitude towards e-learning and self-directed learning with technology

Predictive Variables	R	R ²	F	F Change P	B	Standart Error	β	t	p
Fixed					2.181	.179		10.641	.000**
Self-directed with technology	.328	.108	37.231	.000	.328	.053	.328	2.957	.003

* $p<.05$, ** $p<.01$

It is seen that linear regression analysis results show the students' self-directed learning with technology predicts students' attitude towards e-learning significantly ($R=0.328$, $R^2=0.108$, $F(1,309) = 37,231$; $p<.05$). Nearly %11 of the variance of students' attitude towards e-learning can be explained by students' self-directed learning with technology.

Results and Discussion

According to the results of current study, levels of students' self-directed learning with technology and attitude towards e-learning is slightly higher. Students' self-directed learning with technology and students' attitude towards e-learning do not differ in terms of gender. Also students' self-directed learning with technology and attitude towards e-learning do not differ in terms of purpose of internet use whether it is used for educational purpose or not. But it is found statistically significant differences in students' self-directed learning with technology and attitude towards e-learning in terms of students' daily internet use time. Self-directed learning with technology of students who use internet higher than 4 hour in a day are higher than students who use internet lower than 1 hour in a day. Also attitude towards e-learning of students who use

internet higher than 4 hour in a day are higher than students who use internet lower than 1 hour in a day. It is found statistically significant differences in students' self-directed learning with technology and attitude towards e-learning in terms of frequency of internet/computer use during school lessons. Self-directed learning with technology of students who usually use internet/computer during school lessons are higher than students who rarely use internet/computer during school lessons. Also attitude towards e-learning of students who "usually" use internet/computer during school lessons are higher than students who "rarely" use internet/computer during school lessons. According to the regression analysis results, the students' self-directed learning with technology predict students' attitude towards e-learning significantly. Nearly %11 of the variance of students' attitude towards e-learning can be explained by students' self-directed learning with technology.

It is seen that results of current study consistent with results of other studies. According to Lee et al (2014) and Demir et al (2014) students self-directed learning with technology is slightly higher. Also according to Paris (2004) and Kandil inçeç (2015) students' attitudes toward e-learning is higher. Therefore today, ICT is an important part of daily life (Almarabeh et al, 2016), it is expected that students have higher self directed learning with technology and higher attitude toward e-learning. However, levels of students' attitude towards e-learning and self-directed learning with technology are not at the desired level. This may be due to students' experiences with e-learning and self-directed learning with technology. Students may have limited or negative experience with e-learning. Students may also have limited opportunities and experiences in relation to self-directed learning with technology. Students should benefit from ICT-based learning opportunities such as e-learning, online learning, mobile learning etc by increasing level of students' self-directed learning with technology and attitude towards e-learning.

When the results of this study are evaluated in terms of gender, it is seen that similar and different results have been obtained in some other studies. According to Demir et al (2014), Jaleel and Anuroofa (2017) there is no significant difference in students' self-directed learning with technology in terms of gender. It is thought that because technology is used by everyone as a source of information without gender differences and self-directed learning with technology is a general personal characteristic, students' self-directed learning with technology do not differ in terms of gender. When the attitudes towards e-learning are investigated in terms of gender, it is possible to encounter different results. For example according to Kandil İnçeç (2015), Suri and Sharma (2013) and Paris (2004) found no gender differences in relation to the attitudes towards e-learning. But some studies revealed that male students have more positive attitudes towards e-learning than female students (Liaw & Huang, 2011; Papaioannou & Charalambous, 2011). The reason for this differentiation in the results of researches may be due to the differences in the samples. Also students' experiences related to e-learning in different research samples may vary. These differences in students' experiences related to e-learning may have affected students' attitudes toward e-learning.

One of interesting result of this study is that students' self-directed learning with technology and attitude towards e-learning do not differ in terms of purpose of internet use whether it is used for educational purpose or not. It maybe excepted that students' self-directed learning with technology do not differ in terms of purpose of internet use. But it is expected students' attitude towards e-learning differ in terms of purpose of internet use. Because e-learning is an approach based on the use of internet computer for educational purposes (Sun et al., 2008; Welsh et al., 2003). Therefore it is expected students who use the internet for educational purposes more often may have higher attitudes towards e-learning. But internet is used by people to do a very different task such as, social media, banking, research, news, game etc (Almarabeh et al., 2016) and learning is just one of these tasks of internet. It is thought that since the educational use of the internet is not seen as a necessity, such a result has emerged in this research.

When the results of this study are evaluated in terms of internet use time and frequency of computer/internet during school lessons it is seen that there are results of some studies consistent with these results. According to Lee et al (2014), students' use of technology for learning is important factor for their learning with technology. Also according to Rashid and Asghar (2016) use of technology has a direct positive relationship with students' engagement and self directed learning. There are consistent research results in relation to the attitude towards e-learning. For example according to study of Kandil İngeç (2015), experience in the use of computers, frequency of using internet are important for students' attitude towards e-learning. Also according to Paris (2004) there is positive correlation between internet use and e-learning attitudes of students. The results of the some indirect studies are found to be consistent with the results of the present study. According to Brandström (2011), internet is a valuable teaching tool which can increase the motivation of the students, make teaching more enjoyable, and allow variation in teaching. According to Agyei and Voogt (2011) accessibility of technology tends to affect student attitudes and correlates positively with the level of technology use. According to Rhema and Miliszewska (2014) student levels of access to technologies represent an initial factor that would shape their attitudes towards e-learning. Accessibility of technology is indirect but it is first step to use technology. It is the infrastructure step of using ICT. ICT infrastructure adequacy allows students to use more ICT both in their daily life and in learning. As a result of this situation, it is thought that levels of students' self directed learning with technology and attitudes towards e-learning will increase.

When the results of this study are evaluated in terms of relationship between self-directed learning with technology and attitude towards e-learning, it is said that expected results can be obtained. Because e-learning requires taking responsibility of the individual in learning (Zhang et al., 2004). Also self directed learning refers to the ability to take responsibility in learning (Abdullah, 2001). So the main purpose of current study is to determine the probable relationship between students' self-directed learning with technology and attitude towards e-learning. Also results of the current research indicate that students' self-directed learning with technology predict students' attitude towards e-learning significantly. Also there are results of some indirect studies consistent with this result of current study. According to Demir et al (2014) there is high level positive correlation between students' self directed learning with technology and attitude toward computer. E-learning is one of computer and network technology based learning system (Gunasekaran et al, 2002; Paris, 2004; Welsh et al., 2003). So it is thought that this indirect results consistent with the result of the current study. Also some other studies indicated that there is positive relationship between SDL and technology use in learning (Hill, 2007; Vonderwell and Turner, 2005). Technology use in learning may be effective at increasing student self-directed learning or achievement but only through proper instruction and demonstration (Bartholomew, 2016). This result obtained from the current study confirms that SDL is skill or characteristic associated with technology or ICT. Also self-directed learning with technology is important for e-learning and it might be associated with other ICT based learning such as on-line learning, mobile learning etc.

Conclusion

Consequently, current study indicate that gender and purpose of internet use are not important factor for students' self-directed learning with technology and attitude towards e-learning. But frequency of internet use or time both in school lessons and out of school are important factors for students' self-directed learning with technology and attitude towards e-learning. Also students' self-directed learning with technology is one of important predictors of students' attitude towards e-learning. To increase students attitudes towards e-learning, one of the most popular learning of 21. century, levels of students' self-directed learning with technology should be increased.

In light of the results of the study, the following recommendations can be made:

- When designing e-learning applications, levels of students' self-directed learning with technology should be taken into account by practitioners.

- To increase levels of students' self-directed learning with technology, internet/ICT use time should be increased both at school and outside the school. But it should be ensured that students use the internet/ICT in a conscious and purposeful way. To do this schools and families should cooperate.
- The necessary infrastructure (mobile devices, network, wi-fi) should be established to increase the internet/ICT use of students by schools and parents.

Limitations and Further Study

Although the results of current study are conclusive, this study is not without its limitations. Sample size is limited to get more generalizing results. Since it is a correlational and quantitative research, it contains only descriptive data related to students attitude towards e-learning and self-directed learning with technology. For future research, similar research could be conducted with a larger samples. Experimental studies related to students' attitudes towards e-learning and self-directed learning with technology and studies related to relationship between student achievement in e-learning and students' self-directed learning with technology could be conducted. Researches can be conducted to determine relationship between students' self-directed learning with technology and other ICT based learning such as on-line learning, mobile learning etc.

Genişletilmiş Özet

Problem Durumu

Günümüzde bilgi ve iletişim teknolojisinde hızlı gelişmeler olmakta ve bu gelişmeler birçok alanı etkilemektedir. Etkilenen alanlardan biriside eğitimidir (Al-Musawi, 2014). İnternet başta olmak üzere bilgi ve iletişim teknolojilerinin eğitimde kullanımı yaygınlaşmakta (Demir & Yurdugül, 2014; Liaw, Huang & Chan, 2007) ve eğitimin biçimini değiştirmektedir (Liaw & Huang, 2011; Suri & Sharma 2013). Son zamanlarda bir çok araştırmanın konusu olan e-öğrenme de eğitimde iletişim teknolojilerinin kullanımının bir ürünüdür (Kisanga & Ireson, 2016; Sun vd., 2008). Çok sayıda araştırma olmasına rağmen e-öğrenmeyi etkileyen faktörlere ilişkin sonuçlar net bir şekilde ortaya konamamıştır (Zhang vd., 2004). Son zamanlar da e-öğrenme ile 21. yüzyılın becerileri olarak tanımlanan kendi kendine öğrenme arasında ilişki olabileceğini gösteren araştırmalar vardır (Song & Hill, 2007; Vonderwell & Turner, 2005).

E-öğrenme temelde bilgisayar ve internet teknolojilerini kullanılarak öğrenme sürecinin gerçekleştirilmesini ifade etmektedir (Sun vd., 2008; Welsh vd., 2003). Öğrenmenin modern şekli olarak ifade edilen e-öğrenme günümüzde oldukça popülerdir (Kisanga & Ireson, 2016; Poulova & Simonova, 2009). E-öğrenmeye yönelik tutum da e-öğrenmeye katılımı, e-öğrenme sürecini öğrenci başarısını etkileyen önemli bir faktördür (Pérez Cereijo, 2006; Zhang & Bhattacharyya, 2008). Knowles (1975) tarafından ortaya konulan kendi kendine öğrenme de ise bireyin kendi öğrenme sorumluluğunu alması ve öğrenme sürecini yönetmesi vurgulanır (Abdullah, 2001). Kendi kendine öğrenme becerileri bilgi çağı olan 21. yüzyılın kritik becerileri olarak ifade edilmekte ve araştırmalara konu olmaktadır (Guglielmino, 2008; 2013; Owen, 2002; Rees & Bary, 2006). Ayrıca kendi kendine öğrenme teknolojiyle ilişkilidir (Timothy et al., 2010). Öğrenme sürecinde özyönetim gerektiren e-öğrenme (Zhang vd., 2004) ile bireyin öğrenme sürecinin sorumluluğunu almasını vurgulayan kendi kendine öğrenme (Abdullah, 2001) ortak ve tamamlayıcı özellikleri içermektedir. Bu nedenle ikisi arasındaki ilişkinin incelenmesi gerekmektedir. Ayrıca alanyazında bu ikisi arasındaki ilişkiyi inceleyen bir araştırmaya rastlanmamıştır.

Araştırmanın Amacı

Bu araştırmanın amacı ortaokul öğrencilerinin teknolojiyle kendi kendine öğrenmeleri ile e-öğrenmeye yönelik tutumları arasındaki ilişkiyi incelemektir. Bu kapsamda şu sorulara cevap aranacaktır:

1. Ortaokul öğrencilerinin e-öğrenmeye yönelik tutumları ve teknolojiyle kendi kendine öğrenmeleri ne düzeydedir?
 - 2.1. Ortaokul öğrencilerinin e-öğrenmeye yönelik tutumları ve teknolojiyle kendi kendine öğrenmeleri cinsiyetlerine göre farklılaşmakta mıdır?
 - 2.2. Ortaokul öğrencilerinin e-öğrenmeye yönelik tutumları ve teknolojiyle kendi kendine öğrenmeleri interneti kullanım amaçlarına göre farklılaşmakta mıdır?
 - 2.3. Ortaokul öğrencilerinin e-öğrenmeye yönelik tutumları ve teknolojiyle kendi kendine öğrenmeleri günlük ortalama internet kullanım sürelerine göre farklılaşmakta mıdır?
 - 2.4. Ortaokul öğrencilerinin e-öğrenmeye yönelik tutumları ve teknolojiyle kendi kendine öğrenmeleri okul derslerindeki internet/bilgisayar kullanım sürelerine göre farklılaşmakta mıdır?
 - 2.5. Ortaokul öğrencilerinin teknolojiyle kendi kendine öğrenmeleri, e-öğrenmeye yönelik tutumlarını yordamakta mıdır?

Yöntem

Araştırma ilişkisel araştırma modelinde tasarlanmıştır. Araştırmanın örneklem grubunu Malatya ilindeki beş farklı ortaokulda okuyan 313 öğrenci oluşturmaktadır. Öğrencilerin 155'i (49 %) bayan, 158'i (51

%) erkektir. Araştırma verileri 2015-2016 akademik yılında Teo, Tan, Lee, Chai & Koh tarafından geliştirilen ve Demir & Yurdugül (2013) tarafından Türkçeye uyarlanan teknolojiyle kendi kendine öğrenme ölçeği ve Haznedar ve Baran (2012) tarafından geliştirilen e-öğrenmeye yönelik tutum ölçeğiyle toplanmıştır. Beşli likert tipinde olan teknolojiyle kendi kendine öğrenme ölçeği özyönetim, niyetsel öğrenme olmak üzere 2 boyut ve 6 maddeden oluşmaktadır. Bu araştırma için Cronbach's alpha iç tutarlılık katsayısı .624 olarak hesaplanmıştır. Beşli likert tipinde hazırlanan tek faktörlü ve 20 maddeden oluşan e-öğrenmeye yönelik tutum ölçeği için Cronbach's alpha iç tutarlılık katsayısı ise .902 olarak hesaplanmıştır. Betimsel istatistikler kullanılarak araştırma verilerinin normallik, doğrusallık gibi varsayımları incelenerek analize hazır hale getirilmiştir. Araştırma verilerinin analizinde ortalama ve frekans gibi betimsel istatistik teknikler, grup karşılaştırmalarında bağımsız örneklem t testi ve tek yönlü ANOVA, farklılık olan grupları belirleyen Scheffe, ilişkilerin belirlenmesinde korelasyon ve basit doğrusal regresyon kullanılmıştır.

Bulgular

Araştırmada elde edilen bulgulara göre öğrencilerin teknolojiyle kendi kendine öğrenmeleri ($\bar{x}=3.27$) ve e-öğrenmeye yönelik tutumları ($\bar{x}=3.25$) kısmen yüksektir. Öğrencilerin teknolojiyle kendi kendine öğrenmeleri ve e-öğrenmeye yönelik tutumları cinsiyet ve interneti kullanım amaçlarına göre farklılaşmamaktadır. Fakat öğrencilerin teknolojiyle kendi kendine öğrenmeleri ve e-öğrenmeye yönelik tutumları günlük ortalama internet kullanım süreleri ve okul derslerinde internet/bilgisayar kullanım sıklıklarına göre anlamlı düzeyde farklılaşmaktadır. Günlük ortalama 4 saat ve üzeri internet kullanan öğrencilerin günlük ortalama 1 saat ve altı internet kullanan öğrencilere göre teknolojiyle kendi kendine öğrenmeleri ve e-öğrenmeye yönelik tutumları daha yüksektir. Okul derslerinde “genellikle” internet/bilgisayar kullanan öğrencilerin teknolojiyle kendi kendine öğrenmeleri ve e-öğrenmeye yönelik tutumları okul derslerinde “nadiren” internet/bilgisayar kullanan öğrencilerden daha yüksektir. Araştırmanın temel sorusuna ilişkin bulgu incelendiğinde öğrencilerin teknolojiyle kendi kendine öğrenmeleri, e-öğrenmeye yönelik tutumlarıyla ilişkili olduğu belirlenmiştir. Öğrencilerin teknolojiyle kendi kendine öğrenmeleri, e-öğrenmeye yönelik tutumlarını anlamlı düzeyde yordamakta ve %11’ini açıklamaktadır.

Sonuçlar ve Tartışma

Elde edilen sonuçlar alanyazınla karşılaştırıldığında benzer sonuçların elde edildiği görülmüştür. Öğrencilerin e-öğrenmeye yönelik tutumları ve teknolojiyle kendi kendine öğrenme düzeyleri diğer araştırmalarda da kısmen yüksek olduğu görülmüştür (Demir vd., 2014; Kandil İnceç, 2015; Lee vd., 2014; Paris 2004). Birçok çalışmada e-öğrenmeye yönelik tutumları ve teknolojiyle kendi kendine öğrenmelerinin cinsiyet değişkenine göre anlamlı farklılık oluşturmadığı belirlenmiştir (Demir vd., 2014; Jaleel & Anuroofa, 2017; Kandil İnceç, 2015; Paris 2004; Suri & Sharma, 2013). Elde edilen bu sonuçların günümüzde herkesin cinsiyet ayrımı olmaksızın teknolojiyle iç içe olmasından kaynaklandığı düşünülmektedir. Öğrencilerin e-öğrenmeye yönelik tutumları ve teknolojiyle kendi kendine öğrenmelerinin internet kullanım amacına göre farklılaşmadığı görülmüştür. Bu durumun günümüzde internetin birçok farklı amaç için kullanılması, sadece öğrenmeye özgü olmamasından kaynaklandığı düşünülmektedir. Öğrencilerin e-öğrenmeye yönelik tutumları ve teknolojiyle kendi kendine öğrenmelerinin internet kullanım süresi ve okul derslerinde internet kullanım sıklığına bağlı olarak daha sık kullananlar lehine anlamlı şekilde farklılaşması önemli bir sonuçtur. Öğrencilerin internet deneyimlerinin artmasına bağlı olarak zamanla teknolojiyle kendi kendine öğrenmelerini ve e-öğrenmeye yönelik tutumlarını olumlu etkilemesi sözkonusudur. Alanyazında da teknoloji kullanımının e-öğrenmeye yönelik tutumla pozitif ilişkili olduğunu gösteren çalışmalar vardır (Kandil İnceç, 2015; Lee et al, 2014; Paris 2004; Rashid & Asghar, 2016). Bu araştırmada teknolojiyle kendi kendine öğrenmenin e-öğrenmeyle ilişkili olması ve önemli oranda açıklaması beklenen bir sonuçtur. Çünkü e-öğrenme, öğrenmede kendi sorumluluğunu almayı gerektirmektedir (Zhang vd., 2004). Kendi kendine

öđrenme ise öđrenmede sorumluluk alma becerilerini ifade etmektedir (Abdullah, 2001). Alanyazına bu bulguyu destekleyen dolaylı arařtırmalar vardır (Demir vd., 2014; Hill, 2007; Vonderwell & Turner, 2005).

Bu arařtırmanın sonuçlarına göre cinsiyet ve internet kullanım amacı ortaokul öđrencilerinin e-öđrenmeye yönelik tutumlarını ve teknolojiyle kendi kendine öđrenmelerini belirlemede önemli bir faktörler deđilken günlük ortalama internet kullanım süresi ve okul derslerinde internet kullanım sıklığı önemli faktörlerdir. Teknolojiyle kendi kendine öđrenme, e-öđrenmeye yönelik tutumla ilişkilidir ve e-öđrenmeye yönelik tutumu önemli derecede açıklamaktadır.

Öneriler

Bu sonuçlar e-öđrenme uygulamaları hazırlanırken öđrencilerin teknolojiyle kendi kendine öđrenme düzeylerinin dikkate alınması gerektiğini göstermektedir. Ayrıca öđrencilerin teknolojiyle kendi kendine öđrenme düzeyleri artırmak için hem okulda hemde okul dışında internet ve bilgi iletişim teknolojilerini daha sık ve bilinçli kullanmaları sağlanmalıdır. Bu konuda okul ve aileler işbirliği yapabilir. Öđrencilerin internet ve bilgi iletişim teknolojilerini kullanabilmeleri için gerekli altyapı (mobil cihazlar, ađ bağlantısı, wi-fi) okullar ve aileler tarafından sağlanmalıdır.

Sınırlılıklar ve Arařtırma Önerileri

Göreceli olarak küçük bir örnekleme yapılmıř olması, bu arařtırma sonuçlarının genellenebilirliđi açısından sınırlılıktır. Bunun yanında bu arařtırmada nicel olarak elde edilen betimsel veriler yüzeyseldir. Benzer çalıřmalar büyük örneklemlerle, deneysel ve karma yöntemler kullanılarak ve öđrenci başarısı da dahil edilerek yapılabilir. Bunun yanında öđrencilerin teknolojiyle kendi kendine öđrenmeleriyle çevrimiçi öđrenme, mobil öđrenme arasındaki ilişkileri ortaya koyacak arařtırmalar yapılabilir.

REFERENCES

- Abdullah, M. H. (2001). Self-directed learning. ERIC Digest. Retrieved <https://files.eric.ed.gov/fulltext/ED459458.pdf>
- Agyei, D. D., & Voogt, J. M. (2011). Exploring the potential of the will, skill, tool model in Ghana: Pre-dicting prospective and practicing teachers' use of technology. *Computers & Education*, 56(2011), 91-100.
- Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological bulletin*, 84(5), 888. Retrieved <http://psycnet.apa.org/record/1978-20968-001>
- Almarabeh, T., Majdalawi, Y. K., & Mohammad, H. (2016). Internet usage, challenges, and attitudes among university students: case study of the university of Jordan. *Journal of Software Engineering and Applications*, 9(12), 577-587.
- Al-Musawi, N. M. M. (2014). Development and validation of a scale to measure student attitudes towards e-learning. *Journal of Teaching and Teacher Education*, 210(1183), 1-12.
- Bartholomew, S. (2016). *A mixed-method study of mobile devices and student self-directed learning and achievement during a middle school STEM activity*(Unpublished Phd Thesis), Utah State University, USA.
- Beavers, A. (2009). Teachers as learners: Implications of adult education for professional development. *Journal of college teaching and learning*, 6(7), 25-30.
- Bhuasiri, W., Xaymoungkhoun, O., Zo, H., Rho, J. J., & Ciganek, A. P. (2012). Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. *Computers & Education*, 58, 843-855.
- Bolhuis, S. (2003). Towards process-oriented teaching for self-directed lifelong learning: a multidimensional perspective. *Learning and instruction*, 13(3), 327-347.
- Brändström, C. (2011). *Using the Internet in Education-Strengths and Weaknesses: A Qualitative Study of Teachers' Opinions on the Use of the Internet in Planning and Instruction*. Retrieved <http://www.diva-portal.org/smash/get/diva2:438827/fulltext01.pdf>
- Brookfield, S. (1985). Self-directed learning: A critical review of research. *New Directions for adult and continuing education*, 1985(25), 5-16.
- Caffarella, R. S. (1993). Self-directed learning. *New directions for adult and continuing education*, 1993(57), 25-35.
- Caffarella, R. S. (2000). Goals of self-learning. *Conceptions of self-directed learning: Theoretical and conceptual considerations*, 37-48.
- Can, A. (2013). *SPSS ile bilimsel araştırma sürecinde nicel veri analizi*. Ankara: Pegem Akademi.
- Candy, P. C. (2004). *Linking thinking: Self-directed learning in the digital age*. Canberra,, Australia: Department of Education, Science and Training.
- Chiu, C. M., & Wang, E. T. G. (2008). Understanding web-based learning continuance intention: The role of subjective task value. *Information & Management*, 45(3), 194-201.
- Chu, R. J., & Chu, A. Z. (2010). Multi-level analysis of peer support, internet self-efficacy and e-learning outcomes – the contextual effects of collectivism and group potency. *Computers & Education*, 55(1), 145-154.
- Demir, Ö., & Yurdugül, H. (2013). Self-directed learning with technology scale for young students: A validation study. *E-international Journal of Educational Research*, 4(3), 58-73.
- Demir, Ö., & Yurdugül, H. (2014). Ortaokul ve lise öğrencileri için bilgisayara yönelik tutum ölçeğinin Türkçe'ye uyarlanması. *Eğitim ve Bilim*, 39(176), 247-256.
- Demir, Ö., Yaşar, S., Sert, G., & Yurdugül, H. (2014). Çocukların bilgisayara yönelik tutumları ile teknolojiyle kendi kendine öğrenmeleri arasındaki ilişkinin incelenmesi. *Eğitim ve Bilim*, 39(176), 257-266.
- Ellinger, A. D. (2004). The concept of self-directed learning and its implications for human resource development. *Advances in Developing Human Resources*, 6(2), 158-177.

- Fraenkel, J. R., Wallen, N., & Hyun, H. (2015). *How to design and evaluate research in education*. New York, NY: McGraw-Hill.
- Fuller, R. M., Vician, C., & Brown, S. A. (2006). E-learning and individual characteristics: the role of the computer anxiety and communication apprehension. *Journal of Computer Information Systems*, 46(4), 103–115.
- Garrison, D. R. & Anderson, T. (2003). *E-learning in the 21st Century: A Framework for Research and Practice*. London: Routledge Falmer.
- Gibbons, M. (2002). *The self-directed learning handbook: Challenging adolescent students to excel*. John Wiley & Sons.
- Govindasamy, T. (2001). Successful implementation of e-learning: Pedagogical considerations. *The internet and higher education*, 4(3-4), 287-299.
- Guglielmino, L. M. (2008). Why self-directed learning. *International Journal of Self-directed learning*, 5(1), 1-14.
- Guglielmino, L. M. (2013). The case for promoting self-directed learning in formal educational institutions. *SA-eDUC*, 10(2).
- Gunasekaran, A., McNeil, R. D., & Shaul, D. (2002). E-learning: research and applications. *Industrial and commercial training*, 34(2), 44-53.
- Haznedar, Ö. & Baran, B. (2012). Eğitim fakültesi öğrencileri için e-öğrenmeye yönelik genel bir tutum ölçeđi geliştirme çalışması. *Eđitim Teknolojisi Kuram ve Uygulama*, 2(2), 42-59.
- Al-Hunaiyyan, A., Al-Huwail, N. and Al-Sharhan, S. (2008) Blended e-learning design: Discussion of cultural issues. *International Journal of Cyber Society and Education*, 1, 17- 32.
- Ingec, S. K. (2015). Investigation of students' attitudes towards e-learning in terms of different variables – A case study in a technical and vocational high school for girls. *Educational Research and Reviews*, 10(1), 81–91.
- Jaleel, S., & Anuroofa, O. M. (2017). A study on the relationship between self directed learning and achievement in information technology of students at secondary level. *Universal Journal of Educational Research*, 5(10), 1849-1852.
- Jarvis, P. (2004). *Adult education and lifelong learning: Theory and practice*. Routledge.
- Kisanga, D. H., & Ireson, G. (2016). Test of e-Learning Related Attitudes (TeLRA) scale: Development, reliability and validity study. *International Journal of Education and Development using Information and Communication Technology*, 12(1), 20.
- Knowles, M. S. (1975). *Self-Directed Learning*. New York: Association Press.
- Lee, K., Tsai, P. S., Chai, C. S., & Koh, J. H. L. (2014). Students' perceptions of self-directed learning and collaborative learning with and without technology. *Journal of Computer Assisted Learning*, 30(5), 425-437.
- Liaw, S. S., & Huang, H. M. (2011). A study of investigating learners attitudes toward e-learning. *5th International Conference on Distance Learning and Education IPCSIT vol.12 (2011)*, IACSIT Press, Singapore.
- Liaw, S. S., Huang, H. M., & Chen, G. D. (2007). Surveying instructor and learner attitudes toward e-learning. *Computers & Education*, 49(4), 1066-1080.
- Link, T. M., & Marz, R. (2006). Computer literacy and attitudes towards e-learning among first year medical students. *BMC medical education*, 6(1), 34. Retrieved <https://bmcmededuc.biomedcentral.com/track/pdf/10.1186/1472-6920-6-34>
- Merriam, S. B., & Caffarella, R. S. (1999). *Learning in adulthood*. San Francisco: JosseyBass.
- Mezirow, J. (1985). A critical theory of self-directed learning. İçinde S. Brookfield (Ed.), *Self-directed learning: From theory to practice* (pp. 17-30). *New Directions for Continuing Education*, No. 25. San Francisco: Jossey-Bass.
- Moore, J. L., Dickson-Deane, C., & Galyen, K. (2011). e-learning, online learning, and distance learning environments: Are they the same?. *The Internet and Higher Education*, 14(2), 129-135.
- Oddi, L. F. (1987). Perspectives on self-directed learning. *Adult Education Quarterly*, 38(1), 21-31.

- Ong, C. H. & Lai, J. Y. (2006). Gender differences in perceptions and relationships among dominants of e-learning acceptance. *Computers in Human Behavior*, 22(5), 816-829.
- Owen, T. R. (2002). Self-Directed Learning in Adulthood: A Literature Review.
- Papaioannou, P., & Charalambous, K. (2011). Principals' attitudes towards ICT and their perceptions about the factors that facilitate or inhibit ICT integration in primary schools of Cyprus. *Journal of Information Technology Education*, 10, 349-369.
- Paris, P. G. (2004). E-Learning: A study on secondary students' attitudes towards online web assisted learning. *International Education Journal*, 5(1), 98-112.
- Pituch, K. A., & Lee, Y. K. (2006). The influence of system characteristics on e-learning use. *Computers & Education*, 47(2), 222-244.
- Rashid, T., & Asghar, H. M. (2016). Technology use, self-directed learning, student engagement and academic performance: Examining the interrelations. *Computers in Human Behavior*, 63, 604-612.
- Rees, M., & Bary, R. (2006). Is self-directed learning the key skill for tomorrow's engineers? *European Journal of Engineering Education*, 31(1), 73-81.
- Rhema, A., & Miliszewska, I. (2014). Analysis of student attitudes towards e-learning: The case of engineering students in Libya. *Issues in informing science and information Technology*, 11, 169-190.
- Rosenberg, M. J. (2000). *E-learning: Strategies for delivering knowledge in the digital age*. New York: McGraw-Hill.
- Shih, P., Muñoz, D., & Sanchez, F. (2006). The effect of previous experience with information and communication technologies on performance in a web-based learning program. *Computers in Human Behavior*, 22(6), 962-970.
- Smedley, A., (2007). The self-directed learning readiness of first year bachelor of nursing students. *Journal of Research in Nursing* 12 (4), 373-385.
- Song, L., & Hill, J. R. (2007). A conceptual model for understanding self-directed learning in online environments. *Journal of Interactive Online Learning*, 6(1), 27-41.
- Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & education*, 50(4), 1183-1202.
- Suri, G., & Sharma, S. (2013). The impact of gender on attitude towards computer technology and e-learning: An exploratory study of Punjab University, India. *International Journal of Engineering Research*, 2(2), 132-136.
- Tavangarian, D., Leypold, M. E., Nölting, K., Röser, M., & Voigt, D. (2004). Is e-learning the solution for individual learning?. *Electronic Journal of E-learning*, 2(2), 273-280.
- Timothy, T., Chee, T. S., Beng, L. C., Sing, C. C., Ling, K. J. H., Li, C. W., & Mun, C. H. (2010). The self-directed learning with technology scale (SDLTS) for young students: An initial development and validation. *Computers & Education*, 55(4), 1764-1771.
- Ülgen, G. (1994). *Eğitim psikolojisi: Kavramlar, ilkeler, yöntemler, kuramlar ve uygulamalar*. Ankara: BilimYayınları.
- Vonderwell, S., & Turner, S. (2005). Active learning and preservice teachers' experience in an online course: a case study. *Journal of Technology and Teacher Education*, 13(1), 65-84.
- Welsh, E. T., Wanberg, C. R., Brown, K. G., & Simmering, M. J. (2003). E-learning: emerging uses, empirical results and future directions. *international Journal of Training and Development*, 7(4), 245-258.
- Zhang, D., Zhao, J. L., Zhou, L., & Nunamaker Jr, J. F. (2004). Can e-learning replace classroom learning?. *Communications of the ACM*, 47(5), 75-79.
- Zhang, P., & Bhattacharyya, S. (2008). Students' views of a learning management system: A longitudinal qualitative study. *The Communications of the Association for Information Systems*, 23(2008), 351-374.