



Factors Directing Students to Academic Digital Reading *

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Abstract

This research study aims at investigating at which level the variables of academic and recreational digital reading attitude, technology attitude, and possession of social media account and mobile devices predict the classification of students as those who perform more academic digital reading and who perform less academic digital reading. The participants of the research are 259 students (120 male, 139 female) within the age range of 13-15 who were attending the 8th-grade of 3 state secondary schools in the city center of Düzce. In accordance with the purpose, the Logistic Regression Analysis (LRA) was preferred. It was seen in the regression model that variables of academic digital reading attitude and technology tendency are significant predictive variables in estimating the academic digital reading group membership of the students of 13-15 age group. It was also found in the model that recreational digital reading attitude, negativity of technology, contribution and importance of technology, technology for all, possession of online mobile devices, possession of an active social media account and gender variables are not significant predictors of students performing less or more digital reading. It can be argued based on the research results that supporting the academic digital reading attitude and technology tendency together may provide more qualified attainments regarding the purpose of online reading for learning.

Keywords

Academic digital
Digital reading
Online reading

Article Info

Received: 06.14.2016

Accepted: 12.06.2016

Online Published: 12.30.2016

DOI: 10.15390/EB.2016.6655

* This study was presented at 14th International Primary Teacher Education Symposium on May 21-23, 2015, Bartın University, Turkey.

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Introduction

Digital platforms have been occupying more place in human life than it was ten years ago, and continuing to facilitate the life. The data is increasingly being created, processed, and converted into information and re-consumed in modern societies on social media day by day. Land phones are now being replaced by smart mobile devices and so are desktops by laptops. This replacement is also felt in reading and writing media, and pencil and paper is replaced by monitor and keyboard at an increasing pace (Farinosi, Lim, & Roll, 2016). As for today's educational-instructional applications in the modern world, it has become almost an obligation to use digital platforms in homework or in-class research studies especially which involves reading studies for learning purposes. Because the primary purpose of online reading is "reading for learning" (Leu, Forzani, Timbrell, & Maykel, 2015). Media on which digital reading is performed are mostly the mobile devices. Performance of reading on mobile media is an indicator of the fact that boundaries of schools, libraries and studies have been removed (Shimray, Keerti, & Ramaiah, 2015). Yet, it is difficult to say that these developments to change the field of education directly are examined in detail even if this is considered an advantage in the modern world (Farinosi et al., 2016). The era which we live in, however, is an era in which instructional practices have been integrated with technology increasingly day by day. Whereas it has been expected that the process of learning how to read was to evolve from "learning how to read" into "reading for learning," it seems more appropriate to update this proposition as evolution "We learn to read, and then we read to learn online" (Leu et al., 2015, p. 139). In an environment in which it is so important to read on online or digital media, it becomes even more important to identify what is critical in students' preference regarding the reading media.

Literature review

Selection of media: Digital or paper?

There are quite different definitions of reading activities performed on digital media. Güneş (2016) explains reading on digital media as "reading on screen" and defines it as an "active process in which individuals interpret information on the screen into new meanings and construct it on their minds" (p.5). McKenna, Conradi, Lawrence, Jang, and Meyer (2012) define it as the reading activities that cover all the media and texts encountered in the digital media. Then, it is also possible to define digital reading as a dynamic sense making process which is run with the help of basic knowledge of technology use based on the stimuli on the screen.

What differences the reading media being screen or paper create has been followed by researchers curiously in recent years. The studies have been especially focused on this media differentiation's levels of affecting other factors such as reading comprehension, reading rate, accurate reading, and eyestrain (Baştuğ & Keskin, 2012; Mizrachi, 2014; Podolsky & Soiferman, 2014; Porion, Aparicio, Megalakaki, Robert, & Baccino, 2016). The most important alteration brought about by the media differentiation is on reading comprehension. It is stated that the reading comprehension level in activities of reading on paper is higher than the one in activities of reading on screen or with digital texts (Baştuğ & Keskin, 2012; Güneş, 2016; Mizrachi, 2014). Student preferences also indicate that this proposition is true. It is known that students prefer paper media especially in longer reading activities such as studying or reading novels (Farinosi et al., 2016; Vernon, 2006). Indeed, comprehension is achieved better in readings on paper. Mangan, Walgermo, and Bronnick (2013) argue that paper can provide the reader with stimuli related to place and time, touching the paper and turning the pages make it easier to recall things, but the case is not the same with the reading on a screen moving upward and downward. Güneş (2016) state that most readers place the information in their minds in accordance with their position on the page when reading paper texts and recall the information more conveniently.

In addition to the advantages regarding the comprehension and recall in the paper media mentioned above, there are some other reasons for the reading media. Several variables are suggested for the causes of this preference. One of them is cognitive load. Macedo-Rouet, Rouet, Epstein, and Fayard (2003) addressed the reading on screen and paper in terms of the cognitive load it burdens on

individuals in their study and it was revealed that screen reading causes more cognitive load. Because constructing the information in mind occurs more intensively and in a more complex way in reading on screen (Güneş, 2016). Another factor in the selection of media is the length of the text to be read. In the study performed by Mizrachi (2014), it was concluded that the students preferred the electronic medium if the text is less than five pages while preferring the paper medium if it is more than ten pages. Another factor is surface legibility. Surface legibility includes perceptual properties such as typography on the screen, colors, contrast, etc. Texts on the computer screen have less surface legibility than the texts on the paper. Intelligibility of texts is rather about deep legibility which involves text's semantic construct (Macedo-Rouet et al., 2003). It is expected that both surface and deep legibility of texts are in a format to facilitate the comprehension of the text. Yet, it is argued that readers experience difficulties such as constructing the information and disorientation more frequently in reading on screen than in reading on paper (Eshet-Alkalai & Geri, 2007). At this point, it becomes necessary to develop and improve digital platforms further (Myrberg & Wiberg, 2015). Indeed, majority of students use their laptops to read e-books instead of more advanced devices such as e-readers (Millar & Schrier, 2015).

Eshet-Alkalai and Geri (2007) investigated the effect of the reading media (paper/digital) on message communication in their study. In the study, the performance levels of younger and older readers were compared in terms of being able to read the reports in digital format critically and it was concluded that the younger participants exhibited better performance than the older participants. On the other hand, Myrberg and Wiberg (2015) emphasize the importance of readers' attitude in the selection of reading media and state that digital books should be enhanced further. Pointing out the attitude, too, Duran and Topbaşoğlu (2015) found in their study that the participants assumed a positive attitude towards digital-interactive books. Mizrachi (2014) stated that, in addition to the factors affecting the preference of media mentioned above, eyestrain is commonly frequent in digital reading and paper media are more preferred so that important subjects can be comprehended although it is more expensive.

Yet, the case described to this point also includes a contradiction in itself. If reading on paper is preferred due to reasons such as important and longer reading activities, better comprehension, and less eyestrain, why do people buy more e-books? According to the data obtained by McGraw-Hill Education (2015) in the fourth quarter of 2015, the circulation of e-books increased strongly whereas paper books were sold significantly less. Especially based on the 2015 data, the company regards this as a milestone in the transformation from paper to digital. Then, one should take the undeniable amount of readers who prefer digital reading media into consideration. The number of studies performed on the factors affecting the preferences of those readers is quite limited.

Why the digital media?

The amount of reading on digital media (Güneş, 2016), digital data, and the time spent on these media has been increasing day by day (Shimray et al., 2015). Yet, as a prerequisite, it is required to know how to use devices such as computer, laptop, tablet PC and smart phone so that one can read on digital media. According to Fernandez (2003), an individual working in the field of Information and Communication Technologies (ICT) naturally has sufficient knowledge of his/her own field, it is normal for him/her to read on screen. Hahnel, Goldhammer, Naumann, and Kröhne (2016) revealed in the study based on 15-year-old students' data of Programme for International Student Assessment (PISA) in 2012 that basic computer skills, skills of online information assessment and linear reading have a direct impact on online reading. According to them, a well-developed reading skill along with basic ICT skills should be considered being prerequisite to the digital reading.

Shortness of a reading text is regarded as one of the reasons for readers' preference of digital media (Mizrachi, 2014; Vernon, 2006). Majority (57.4%) of 190 students participated in Millar and Schrier (2015)'s research preferred paper books while others (25%) preferred e-textbooks. Two most important justifications of those who preferred e-textbooks are (1) that all books are together on the same media and (2) that they provide much convenience than printed books. Other factors of preference argued in the research are justifications such as affordability, paper saving and easy portability. In the study performed by Woody, Daniel, and Baker (2010) on determining the book preferences (electronic/paper) of students with 91 participants, they found a significant relationship between participants' decisions of e-book use and the variables of frequency of text reading on computer and online information search on computer when studying. It can be argued here that there is a close relationship between being accustomed to use computer and preferring to read on digital media. Similarly, Putman (2014) assert that there is a strong relationship between the attention/value attached to online reading and the general attitude towards computers. In the study performed by Mizrachi (2014), the students regarded it as a great convenience to find and highlight a certain piece of information in the text on digital media. Search/find functions are frequently used especially in the reading activities performed via file formats such as .doc and .pdf (Larson, 2012). On the other hand, it may be quite hard to search for a term when reading on paper media. It can be argued for such reasons that students approach pragmatically to the preference of media.

Majority of the studies on the topic include the data obtained by directly asking students questions about their preferences of reading medium. They provide critical data for planning the educational-instructional processes. Yet, these studies did not achieve any results regarding to what extent academic and recreational digital reading attitudes (Baştuğ & Keskin, 2013; McKenna et al., 2012) and technology attitudes predict the preferences of digital reading. Thus, the main question to which this study tries to find an answer to can be stated as follows: By considering which variables can educators foresee whether students will perform less or more academic reading on digital media? In other words, at which variables should be looked at when it is necessary to classify students as those who perform more academic digital reading and those who perform less academic digital reading? Therefore, it was aimed in the research to investigate to what extent academic digital and recreational digital reading attitude and technology attitude, gender, and possession of social media account and mobile device determine how students perform/do not perform academic digital reading.

Method

Research design

The research was designed in the relational survey model. Due to the categorical structure of the dependent variable and because there are multiple categorical variables among the independent variables, the Logistic Regression Analysis (LRA) was preferred (Leech, Barrett, & Morgan, 2005, p. 51). LRA is a method that helps conduct the categorization and assignment processes in which the expected value of the dependent variable is obtained as probability in respect to independent variables (Özdamar, 2011, p. 571).

Participants

The research data was collected in the spring term of 2014-2015 from eighth-grade students (N=270) whose ages were between 13 and 15 years old and who were attending at three state secondary schools in the city center of Düzce. Yet, the forms with missing information that provided direct data such as gender were excluded from the research and the participants were composed of 259 students (120 males and 139 females). The participation was based on voluntariness and the students who did not want to participate were not included in the research. Online reading skills of 9th-grade students, who are quite close to this age group, are assessed by PISA at certain intervals (OECD, 2012). This makes it even more significant that the research is conducted with this age group.

Measurement Tools

To identify students' academic digital and recreational digital reading attitudes, the "Adolescent Reading Attitudes Survey" was used, which was developed by McKenna et al. (2012) and adopted into Turkish language by Baştuğ and Keskin (2013). The scale is composed of four factors in total. Only the academic digital and recreational digital reading attitude factors were utilized for the study. The reliability coefficients of the scale are $\alpha=.62$ for the academic digital reading attitude, $\alpha=.80$ for the recreational digital reading attitude. The academic digital reading attitude is composed of 4 items while the recreational digital reading attitude comprises of 3 items. The data regarding the confirmatory factor analysis of the scale are RMSEA= .018, AGFI=.96, GFI=.97, NFI=.97, CFI=.99, and S-RMR=.039 (Baştuğ & Keskin, 2013).

"An examination of the factor structures of students' technology attitudes scale: the example of Turkey" of which Turkish version was prepared by Yurdugül and Aşkar (2008) to measure students' attitudes towards technology was used in the study. The factors used in the scale and their reliability coefficients are technology tendency ($\alpha=.85$, 8 items), negativity of technology ($\alpha=.75$, 7 items), contribution and importance of technology ($\alpha=.82$, 6 items) and technology for all ($\alpha=.77$, 3 items). The data regarding the confirmatory factor analysis of the scale are RMSEA= .04, CFI=.90, and NNRI=.92 (Yurdugül & Aşkar, 2008).

The data of other descriptive and categorical variables were obtained from the answers given to the questions in the research form. Those variables are gender, possession of internet-enabled mobile device and possession of an active social media account (Facebook, Twitter, Flickr, Instagram, etc.) For the preference of digital media for academic reading which is the dependent variable of the research, the frequencies of daily review, reading class notes, researching a certain subject for the classes and reading on digital media to prepare for exams were asked to the students. The criteria of frequency in PISA exams were taken as basis to determine the frequencies (OECD, 2012). By these criteria, the score distribution is as "I do not know what this is (1), almost never (2), a few times a month (3), a few times a week (4), a few times a day (5)".

Procedure and The Analysis of Data

A measurement form was created by gathering the related scale items which are the variables of the research and other information-collecting parts. This form was applied to 270 students who were attending at three different state secondary schools in the city center of Düzce. Before applying the form, the school administration was interviewed with, and the data were collected in a class hour which was deemed appropriate after briefing. During the application of the form, the students were told that the participation was on voluntariness basis and they did not have to fill in the form. Moreover, they were asked if they had any questions and explanations were made to those who requested one. The dependent variable of the research has a categorical structure. Since there were categorical variables such as possession of mobile device, possession of social media account, and gender, LRA was deemed suitable for the study (Leech et al., 2005, p. 51). LRA differs from discriminant analysis and multiple regression analysis in the sense that it requires assumptions to be met by researchers in regard to the distribution of independent variables. In other words, normal distribution of independent variables does not require meeting the assumptions such as linearity and equality of variance-covariance matrices (Çokluk, Şekercioğlu, & Büyüköztürk, 2012, p. 59). The scale forms were transferred into the computer environment, and the forms with missing information were not included in the assessment. The data of 259 students which were included in the assessment were analyzed. Missing data in the academic and recreational digital reading attitude and the subdimensions of the technology attitudes scale were filled with average. Later, average data of scales' subdimensions were obtained. The average of the data of academic digital reading frequency, which is the dependent variable, was ranked from greater to smaller. To obtain the data of students who perform less and more digital reading, 25% of the top and the bottom students each were utilized, and the data in between and the ones which were similar were excluded. As a result, 65 students at the top and the bottom each were tagged with (1) and (0)

respectively and 130 student data in total were subjected to LRA. The linear stepwise method was used in LRA because of the suppression effect (Çokluk et al., 2012).

Results

Primarily, reliability coefficients of the data obtained in the scales were looked into. The reliability coefficients of the academic digital and recreational digital reading attitude subdimensions of the Adolescent Reading Attitudes Survey are $\alpha=.74$ and $\alpha=.80$ respectively. The reliability coefficients of the Technology Attitude Scale are $\alpha=.83$ for technology tendency, $\alpha=.73$ for negativity of technology, $\alpha=.80$ for contribution and importance of technology, and $\alpha=.72$ for technology for all.

Multicollinearity is regarded as an important problem in LRA. Thus, multicollinearity among the independent variables which are not categorical was analyzed. VIF values for the variables are 1.21 for "academic digital reading attitude", 1.17 for "recreational digital reading attitude"; 1.65 for "technology tendency", 1.04 for "negativity of technology", 1.36 for "contribution and importance of technology", and 1.76 for "technology for all". VIF results being lower than 10 indicates that there is no multicollinearity problem among independent variables (Çokluk et al., 2012, p. 38). For the multicollinearity of the categorical independent variables, Spearman's rho correlation values were investigated. According to the analysis results, there is no significant relationship between frequency of social media use and gender ($r = -.14, p>.05$). The relationship between possession of online mobile devices and frequency of social media use is a significant one ($r = .47, p<.05$). There is no significant relationship between gender and possession of mobile devices ($r = -.07, p>.05$). It can be accordingly said that there is no significant multicollinearity problem among the variables. Next, the data regarding the model in which there is the constant term were obtained and are given in Table 1.

Table 1. Variables Which are not in The Starting Model

Step 0	Variables	score	df	p
	AD	10.131	1	.001
	RD	2.906	1	.088
	TENDENCY	16.706	1	.000
	NEGATIVITY	.980	1	.322
	CONTIMPORT	5.197	1	.023
	TECHFORALL	9.665	1	.002
	Gender(1)	1.521	1	.218
	Mobile(1)	3.077	1	.079
	Socmed(1)	2.588	1	.108
	Error chi-square statistics	24.104	9	.004

AD=Academic digital reading attitude, RD=Recreational digital reading attitude, TENDENCY=Technology tendency, NEGATIVITY=Negativity of technology, CONTIMPORT=Contribution and importance of technology, TECHFORALL=Technology for all, Mobile= possession of mobile devices, Socmed=frequency of social media use.

The predictive variables which are not in the starting model are presented in Table 1. According to the table, the error chi-square statistics is significant ($\chi^2\beta_0=24.104, p<.05$). This indicates that the coefficients of the predictive variables which are not in the starting model significantly differ from 0. Based on the results, academic digital reading attitude, technology for all, technology tendency and contribution and importance of technology variables means that they will contribute to the model.

Thus, analyses were conducted for the case where the predictive variables fell into the model. The results regarding the intended model which was obtained in the eighth step of the backstepping method are -2 LL=156.913, Cox & Snell $R^2=.164$, and Nagelkerke $R^2=.219$. According to the Cox & Snell R^2 value, addition of the predictive variables to the analysis explains 16.40% of the variance over the dependent variable. The Nagelkerke R^2 value is %21.90%. The Nagelkerke R^2 value was found to be higher than Cox & Snell R^2 value.

Next, Hosmer and Lemeshow test was performed and it was found to be $\chi^2=11.877$, $sd=8$, $sig=.157$ ($p>.05$) in the eighth step. Insignificance of this value shows that the model has an acceptable fit; in other words, the fit between model and the data is sufficient (Çokluk et al., 2012). The classification achieved in the following process is given in Table 2.

Table 2. Classification in The Logistic Regression Model

	Observed	Predicted		Accurate rate of classification
		0	1	
Step 8	0	40	25	61.50
	1	19	46	70.08
	Total rate			66.2

For academic reading, 1=those who perform more digital reading, 0=those who perform less digital reading.

As for the classification in the logistic regression model given in Table 2, 40 out of 65 students who perform less digital reading were accurately classified while 25 students were wrongly classified, and the accurate classification rate is about 62%. 19 out of 65 students who perform more digital reading were wrongly classified whereas 46 were accurately classified, and the accurate classification rate is about 70%. Total accurate classification rate in the intended model is about 66%. Next, the analysis results regarding the estimates of coefficients of the variables in the intended model were examined, and the data are given by steps in Table 3.

Table 3. Coefficient Estimates for The Variables in The Intended Model

		B	S. E	Wald	df	p	Exp(β)
Step 1	AD	.400	.201	3.961	1	.047	1.492
	RD	-.008	.173	.002	1	.962	.992
	TENDENCY	.839	.334	6.300	1	.012	2.313
	NEGATIVITY	-.066	.270	.059	1	.808	.936
	CONTIMPORT	.197	.298	.438	1	.508	1.218
	TECHFORALL	.132	.256	.267	1	.605	1.141
	Gender(1)	.272	.467	.340	1	.560	1.313
	Mobile(1)	.812	.591	1.887	1	.170	2.253
	Socmed(1)	-.141	.653	.047	1	.829	.868
	Constant	-6.330	2.002	10.000	1	.002	.002
Step 2	AD	.399	.198	4.050	1	.044	1.490
	TENDENCY	.835	.328	6.503	1	.011	2.306
	NEGATIVITY	-.068	.268	.064	1	.800	.935
	CONTIMPORT	.195	.294	.440	1	.507	1.215
	TECHFORALL	.132	.256	.267	1	.605	1.141
	Gender(1)	.266	.445	.356	1	.551	1.304
	Mobile(1)	.811	.591	1.883	1	.170	2.251
	Socmed(1)	-.148	.639	.053	1	.817	.863
	Constant	-6.330	2.001	10.010	1	.002	.002
Step 3	AD	.391	.196	3.984	1	.046	1.479
	TENDENCY	.831	.327	6.443	1	.011	2.296
	NEGATIVITY	-.060	.266	.051	1	.821	.942
	CONTIMPORT	.188	.293	.411	1	.522	1.206
	TECHFORALL	.139	.254	.297	1	.586	1.149
	Gender(1)	.283	.440	.414	1	.520	1.327
	Mobile(1)	.747	.519	2.070	1	.150	2.110
	Constant	-6.371	1.998	10.167	1	.001	.002

Table 3. Continue

Step 4	AD	.395	.195	4.082	1	.043	1.484
	TENDENCY	.827	.327	6.405	1	.011	2.286
	CONTIMPORT	.205	.283	.522	1	.470	1.227
	TECHFORALL	.142	.253	.317	1	.574	1.153
	Gender(1)	.277	.439	.398	1	.528	1.319
	Mobile(1)	.775	.505	2.356	1	.125	2.170
	Constant	-6.618	1.690	15.326	1	.000	.001
Step 5	AD	.399	.195	4.179	1	.041	1.490
	TENDENCY	.909	.294	9.538	1	.002	2.482
	CONTIMPORT	.253	.268	.892	1	.345	1.288
	Gender(1)	.285	.438	.422	1	.516	1.329
	Mobile(1)	.761	.505	2.277	1	.131	2.141
	Constant	-6.594	1.690	15.226	1	.000	.001
Step 6	AD	.396	.195	4.133	1	.042	1.486
	TENDENCY	.831	.266	9.765	1	.002	2.295
	CONTIMPORT	.252	.267	.893	1	.345	1.287
	Mobile(1)	.785	.500	2.459	1	.117	2.191
	Constant	-6.214	1.568	15.695	1	.000	.002
Step 7	AD	.394	.193	4.174	1	.041	1.483
	TENDENCY	.886	.260	11.588	1	.001	2.425
	Mobile(1)	.795	.498	2.556	1	.110	2.215
	Constant	-5.463	1.307	17.470	1	.000	.004
Step 8	AD	.430	.191	5.078	1	.024	1.537
	TENDENCY	.838	.254	10.912	1	.001	2.311
	Constant	-4.843	1.215	15.888	1	.000	.008

According to Table 3, it is seen that the variables of academic digital reading attitude and technology tendency are the significant predictors of frequency of academic digital reading in the eighth step. It can be said in the light of these results that an increase of a unit in the predictive “academic digital reading attitude” variable caused an increase of 53.7% [(1-1.537).100] in the odds of being a student who performs more digital reading. It is seen when considering the other predictive variable, “technology tendency that an increase of a unit in the variable caused an increase of 131% [(1-2.311).100] in the odds of being a student who performs more digital reading.

Discussion, Conclusion and Suggestions

It was aimed with this research study to investigate at which level the variables of academic and recreational digital reading attitude, technology attitude, and possession of social media account and mobile devices predict the classification of students as those who perform more academic digital reading and who perform less academic digital reading. In accordance with this purpose, the students were categorized as those who perform less digital reading and those who perform more digital reading. It was seen in the regression model that variables of academic digital reading attitude and technology tendency, which is the subdimension of technology attitudes, are significant predictive variables in estimating the academic digital reading group membership of the students of 13-15 age group. It was also found in the model that recreational digital reading attitude, negativity of technology, contribution and importance of technology, technology for all, possession of online mobile devices, possession of an active social media account and gender variables are not significant predictors of students performing less or more digital reading.

According to the results, it can be understood that academic digital reading attitude is a determinant factor in students performing more reading on digital media. In other words, students with academic digital reading attitude are more likely to read on digital media. It is possible at this point to

argue that academic digital reading attitude is translated into behavior. There is no direct research result regarding the decisiveness of academic digital reading attitude in students' preference of digital media. Yet, there are studies conducted with different variables such as preference of reading on digital media and preference of technological devices as well as attitudes towards them. Rasmusson and Åberg-Bengtsson (2015) concluded that digital reading performance and time spent with computer games are in relation. Putman (2014) states that there is a strong relationship between online reading efficacy and technical computer specialization and general technology attitude.

Another finding obtained in the research is that technology tendency is a significant variable in predicting the odds of students performing academic digital reading. The results of the study performed by Lee and Wu (2012) with PISA data show parallelism with the findings of the research. They revealed that computer use at home has a direct predictive impact on online reading. It is also stated in the same study that online reading is a mediator between computer use and reading activities at home (Lee & Wu, 2012). Similarly, Acar (2015) argues in the study conducted with the PISA 2009 Turkey data that there is a high-level relationship between ICT skills and reading skills and students' ICT efficacy needs to be enhanced so that their online reading skills can be improved. It is possible to interpret the prediction of how students with technology tendency perform more reading on digital media as an indicator that they can transfer their ICT efficacy into reading and comprehension activities. Indeed, it is highly difficult to use those devices without technology literacy. Hohlfeld, Ritzhaupt, Barron, and Kemker (2008) emphasize the importance of the situation and highlight the obligation of basic technology literacy in order to obtain information both via internet and other digital media.

According to the research results, gender had no decisive impact on academic digital reading. Woody et al. (2010) concluded that gender has no predictive impact on the using of e-book. Yet, Woody explains this situation as the fact that the influence of gender has been increasingly reduced as a result that the new millennium freshmen have been engaged in technology even more. There are, however, research studies of which results do not show similarity with these results. Liu and Huang (2008) asserted that female students are more eager about reading on paper than male students while male students are more satisfied with online reading than female students. It can be argued here that gender is a decisive variable of digital reading which has emerged in regard to individuals' need in daily, working and other social lives in time.

Another result of the research is that possession of smart mobile devices is not a significant predictor of academic digital reading. One should consider here the fact that mobile devices are mostly used for communicational or recreational purposes. In the study performed by Neumann (2016), no relationship could be found between emergent literacy skills and frequency of e-book use. Indeed, the primary reason for using mobile devices is communication. For example, Montag et al. (2015) states that smart phones are used for 161 minutes on average daily, and WhatsApp is responsible for average 32 minutes and applications such as Facebook are responsible for average 15 minutes of the total duration. Mobile devices are also used for supporting the learning environments. For example, smart phones are used as an enriching instrument for functions such as text search, question preparing and online searches (Bromley, 2012). It can be argued here that mobile devices are effective instructional instruments when kept under control by educators; otherwise, those devices are used rather for communicational and recreational purposes when used by students independently.

Another result of the research is that social media use and recreational digital reading attitude has no predictive effect on academic digital reading. It is possible to explain this result in two ways: Firstly, the dependent variable of the research is academic digital reading, and it was not affected by recreational digital reading and attitudes because these two types of reading serve different purposes. As known, setting pre-reading goals helps students establish a more qualified interaction with the text (Akyol, 2006). McKenna et al. (2012) and Baştuğ and Keskin (2013) revealed that both reading purposes are firmly separated from each other. In this sense, the finding coincides with the findings of other studies. Secondly, reading on social media and academic digital reading mostly coexist on the same digital platform. This may sometimes make it harder to be motivated to read. For example, Larson (2012)

states that students use their own laptops when studying, they can access their social media accounts on the same laptop, and it is difficult to concentrate on the book in such a condition. Emphasizing the difference here, Tenopir, Volentine, and King (2013) states that social media tools cannot substitute for academic reading and suggests that they should be utilized as a power enriching the academic field.

On the other hand, this newer reading medium also forces reading tools, materials and reading strategies to change. Educational settings and instructional materials need to adapt to this change (Larson, 2015). For example, distribution of digital reading sources in .pdf format is not considered a proper approach. There should be appropriate digital media and devices in e-reading activities (Dwyer & Davidson, 2013). Indeed, user interfaces of the devices in which e-books are offered provide reader with several advantages and very useful, small tools (Passig & Maidel-Kravetsky, 2014; Shimray et al., 2015). On the other hand, publishing companies which write textbooks have been adapting to this change gradually and offer students books in formats allowing for functions such as taking notes, highlighting in the e-textbooks. Yet, most of the students are not informed of such changes (Millar & Schrier, 2015). That is why increasing student awareness of digital reading should be prioritized and its sustainability should be emphasized by systematical studies. In this context, Dwyer and Davidson (2013) compares use of e-book to a new process of course and states that these activities may be hard at the beginning but students will find it easier over time. Based on the fact, addressing the acquirement of habit and skills in the use of e-book can be regarded as an approach to overcoming the current challenges in the topic. As a result of the research, it is possible to see that students can acquire a new skill thanks to affective factors of different fields such as academic digital reading attitude and technological tendency which are determinants of academic digital reading.

Recommendations

Today, it is known that majority of students read on computer monitors. Yet, computer monitors are pieces of equipment produced for general purposes and may not always provide a healthy environment for reading. More specific pieces of equipment produced for that purpose need to be used in the instructional processes which emphasize digital reading. Thus, it becomes necessary that digital book and equipment manufacturers collaborate with educational-instructional planners even more. In this cooperation, it can be primarily recommended to consider important aspects such as enriching the developmental steps of reading, certain fonts used in reading education and the tools that facilitate taking notes and recalling in page layout and to enrich the design within this framework in e-reader software of corporations producing technology. From the aspect of research, it can be suggested as a recommendation that the results of this study are addressed with qualitative and other quantitative research designs from different perspectives and tested with more variables.

This study has a few basic limitations to it. The first one is that only the variables that predict academic digital reading were investigated. Reasons for the preference of reading on recreational or other digital media can be researched in future studies. Another limitation is the grades of the students. It is thought to be necessary to shed light on what reading activities the students in higher grades perform for different purposes on digital media.

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