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Interacting with digital contents: Understanding the on-screen reading behavior of young adults

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Abstract

In Pakistan, the use of electronic gadgets like Ipad, smartphones, laptops, etc. is on the rise. With the exponential growth and availability of digital reading contents, it is also a matter of concern that how readers interact with digital contents? And whether they are aware of features associated with electronic reading devices? The current study aims to examine the level of students' digital information literacy skills and to understand the status of their interaction with digital contents. A survey was conducted using a questionnaire as a data collection tool. The data were collected from the students of the Higher Education Commission (HEC) recognized large and medium-sized universities of Lahore. Findings highlight the student's self-perceived digital information literacy skills and the usage patterns of different techniques/functions associated with on-screen reading.

Keywords: Digital literacy, Digital contents; On-screen reading, Pakistan

Background of the Study

Reading has been a part of human life for ages and has been a source of knowledge transfer to the next generations. Reading is not a natural process; there are no reading genes (Wolf, 2007). Reading is an intellectual effort and has undergone different changes since its inception. The invention of the printing press brought a momentous change in the knowledge world. Johann Guttenberg printed the first version of the Bible using a moveable printing press in the 1450s. In the eighteenth century, moveable printing became commercialized. The industrial revolution brought a change in printing, as a result, industrial information society developed. With time the reading sources underwent different changes in different eras. This process of evolution introduced us to new technology and the world of online digital text. However, printed books are still of importance for users, as some prefer to read only printed books. Consequently, printed and e-books go side by side to achieve the purpose (Ahuja, Mishra, & Goyal, 2010; Cull, 2011).

Changing reading trends and advantages and disadvantages of different reading formats is a topic much under discussion around the globe (Herath, 2010; Liu, 2005; Soroya & Ameen, 2016; Soroya & Amen, 2018; Tenopir et al, 2009). Most of the literature on reading trends in the digital environment dates back from the past decade; as the phenomenon is recently inherent in modern digital reading devices and their impact on reading has presented itself quite recently.

Under this backdrop, certain questions arise, first, what is the level of information literacy skills of the readers as these skills are required for electronic reading, and second, how much readers are capable to interact with digital contents using its features/techniques for annotation.

Although it is difficult to anticipate the impact of a digital paradigm shift in developing countries as they are still in the process of acquiring and developing the technological infrastructure and information resources equal to the amount and the quality of resources available in most developed countries. However, whether developed and developing both types of countries are undergoing a major shift.

In Pakistan, lately, the impact of digital devices on reading habits has been under much discussion in the media, among library science professionals, educationists, and learned community that how the digital revolution is influencing reading trends. Researchers from different disciplines have carried out studies to explore the reading habits of different groups of society i.e. children, adults, men, and women (Awais & Ameen, 2013; Mushtaq, Soroya & Mahmood, 2020; Soroya & Ameen, 2016; Soroya & Ameen, 2018). However, published research studies exploring the subject under the prevailing background could not be found.

There is a dire need to investigate information literacy skills and to examine how students interact with the digital contents. Therefore, the current study was designed to investigate the reading behavior of youth under the digital paradigm. Reading habits of this generation (young adults) is particularly important to study, as they are born and living in a digitally sophisticated environment and they are our future leaders.

Literature Review

With the development of information technology, a vast amount of reading material is available online. Reading from a screen is becoming a common behavior due to several benefits associated with it. However, with the increasing frequency of on-screen information use, there are some questions associated with this behavior. With the growing popularity of the internet and electronic resources, researchers have become skeptical about reading trends of people. It is still an undergoing question that weather reading habits are on the decline or rise due to ICTs. Scholars from the University College London (2008) suggested that we are going through a transition period and that we are maybe in the middle of a sea of change in our way of reading and thinking. Studies show a gradual increase in the likeliness of onscreen reading. Harvor (2013) stated that about a decade ago, rapid changes in information technology impacted the publishing industry. The publishers adopted e-publishing to meet the growing public demand for electronic contents. The industry needs to make e-publishing an integral part of textbook publishing, as with the arrival of smartphones, students prefer to read on-screen. The e-books have been welcomed by the students who use a smartphone to read them. The author argued that the increasing cost of textbooks used in higher education was the main reason behind online reading. Students are very sensitive to textbook prices. Instead of paying the high prices for textbooks, they use illegal means to retrieve electronic versions of the text.

Liu (2005) reported a change in reading behavior in the digital age by asking Americans to self-report on changes in their reading behavior over the last 10 years. As this study was dependent upon the respondents' memory, special attention to the capability of memory was paid when constructing the questionnaire. The author found that readers were likely to engage

in screen-based reading, as 83.2% of respondents reported that their time spent on-screen reading has been increased over the past ten years.

Pew Research Center (2016) reported that there is no decline in reading since 2002 to 2016, Americans are still reading in whatever form, at about the same rate as in 2002, before digital devices became ubiquitous. The report further suggests that Young adults, 18-29-year-olds, are the heaviest readers.

Lately, Soroya and Ameen (2020) reported that Pakistani Millennials are frequent readers of digital contents. The researchers argued that the open access movement is one of the reasons for the popularity of digital contents, as most of the respondents were using the reading material that was available free of cost.

Based on available literature it is established that young adults are adopting e-reading; therefore, it is a dire need to study their competencies to access and effectively utilize these contents.

Interacting On-screen Contents

Several scholars claim that online media has its shortcomings which impact peoples' reading behavior. Despite the apparent increase in online reading, many users reported that they print-electronic material to read on paper (Rho & Gedeon, 2000; Shaikh, 2004; Liu & Huang, 2007). Liu's (2005) study confirms that annotating and highlighting activity is absent in on-screen reading most of the time, however, this is done while reading print documents.

Similarly, Rho and Gedeon (2000) surveyed to investigate reading activities related to online academic articles. They reported that the readers only 'overview' the online academic articles from the screen, and then they get printouts to read.

Likewise, O'hara and Sellen (1997) conducted a laboratory study to discover how reading from paper differs from reading digital documents with the purpose to design better online reading tools. Findings revealed that the benefits of reading from the paper were greater than those of on-screen. The authors mentioned that the difference was because of the major advantages that paper offers i.e. annotation while reading, quick navigation, and flexibility of spatial layout. These, in turn, allow readers to engage in deep and concentrated reading. On the other hand, on-line tools simply do not support the whole integration of notetaking while reading. Whether annotating the source document itself or annotating within a separate document, the process was arduous and distracting.

Vandenhoeck's (2013) study attempted to explore the reading habits and preferences of students while reading academic articles and their preferred ways of interacting with content. The findings of the study revealed that the majority of the students like to read articles in printed form. However, students do not print due to cost and environmental factors. They annotate and highlight documents in print form however they are less aware to use these features in electronic documents, if they learn to use these features, the electronic reading may become more useful and effective. Students like to read articles in print form, but they often read in electronic form due to economic pressure. It is strongly recommended to overcome this knowledge gap to enhance their ability to interact with digital contents. It is suggested that instructions for onscreen reading should be given to students; not to change their preferences,

but to make them more skillful and comfortable in electronic reading, something that they often do. The author suggested that these instructions could be part of curricula or workshops could be held to develop competencies.

Dilevko and Gottlieb (2002) found that 57% of users in their study choose the printed format. To them, the reason for choosing printed resources was the advantage of easy annotation and note-taking associated with print-based reading material. Respondents believed that these resources allowed a general review of the document, while the screen display forced them to read one page at a time. They did concede that while reading online resources on the screen is hard, using these online resources is time-saving and possible at all times and places.

Researchers compared reading behavior from paper vs screen. Empirical data from Liu and Huang (2007) illustrated that people prefer reading on paper where there is a need for reading lengthy documents, in-depth reading, and taking notes.

The reviewed literature revealed that the world is experiencing a paradigm shift from print to screen. ICT applications have influenced everyone. The growth of broadband networks and the increased number of Internet users in the last decade have affected all information stakeholders. Availability and easy access to information through smart devices have influenced the behavior of information users around the globe. Every sector of life is turning into an E-sector. These trends can be seen in Pakistani society as well. Today's young individuals are reflecting on various global information behaviors and changing the ways that they deal with information. Therefore, researchers are required to focus on understanding the young adults' onscreen reading behavior with the purpose to make e-reading more effective.

Research Questions

1. Do higher education students report satisfactory digital information literacy skills?
2. How young adults interact with digital contents?

Research Methods

The current study is based on the data collected for the principal researchers' Ph.D. project. To achieve the objectives of the study, a quantitative research design based on the survey research method was adopted. Final year students of master's level (16 years education) (enrolled to main campuses of HEC classified large and medium-sized general universities of Lahore) were the study population. The sample was selected using a two-stage stratified purposive sampling technique. At the first stage, the population was divided into three strata on basis of subject groups i.e. Science and Technology, Social Sciences, and Arts and Humanities. In the second stage, one department/institute/college from each subject group (i.e. group of Science, group of Social Sciences, and a group of Humanities and Arts) was available in all studied universities. For this purpose, university websites were visited. There were three departments, English Language and Literature (Humanities), Physics (Pure Sciences), and Economics (Social Sciences) which were available to the whole population. The available final year students of master's programs from the sample department/institute/college were the respondents of the study.

The data collection instrument was developed, and pilot tested before final data collection. The principal researcher personally administered the research instrument for data collection after

getting permission from each university. The sample size was 700; however, the researcher received 515 filled questionnaires. As a result, the response rate of the study was reasonable i.e. 74%. The data were analyzed using the Software Package for Social Sciences (SPSS) version 16.0.

Definition of Terms

Reading: Reading for the current study means reading with eye contact to fulfill information need for any purpose either on print or on-screen. Reading through audio/talking software or brail is not taken into consideration here. Furthermore, here reading includes all kinds of reading e.g. academic and non-academic.

Digital/electronic/on-screen reading: Digital/electronic/on-screen reading refers to the reading activities through a computer, laptop, mobile phones, handheld e-readers, etc. either online or offline.

Reading Behavior: For this study, the researchers defined reading behavior as “the way a reader selects, gets and utilizes any reading material available in print or electronic media, for any purpose responding to a given situation”.

Results

There was a total of 515 respondents for the study. From the total, 156 (30.3%) students belonged to the Faculty of Social Sciences, 183 (35.5%) students were from the Faculty of Pure Sciences and 176 (34.2%) respondents were from the Faculty of Humanities and Arts, from the different sample universities of Pakistan. Data shows the participation of students within equal proportion from different subject groups.

The results further reveal that 152 (30.6%) respondents were male and 344 (69.4%) were female. The reason for a larger female representation is that in Pakistan the female students outnumber male students in academic institutes. Furthermore, one of the sample universities was a woman university. 379 (73.6%) respondents were from public sector universities and 136 (26.4%) were from private sector universities. A larger representation from public sector universities was because of the comparatively lower number of enrolled students in private sector universities.

It was also found that 245 (47.6%) responding students were from universities categorized as large-scale universities of Pakistan by HEC, 270 (52.4%) students were from medium-scale universities of Pakistan as categorized by HEC. Thus, almost equal representation was from large-scale and medium-sized universities.

RQ. 1. Do higher education students report satisfactory digital information literacy skills?

Digital information literacy skills could be an important variable to measure reading behavior under the digital paradigm. Therefore, students were asked to indicate their digital information literacy skills. It is worth mentioning that these skills were self-reported by the students.

The results in Table 1. point out that a large majority of the university students believed that they were able to easily locate the required information online to meet their information needs, as 34.6% and 43.1% of students rated this statement always and often respectively. Only a few (1.1%) of them claimed that they have never been able to easily locate their required information.

Table 1.

Digital Information Literacy Skills

Digital Information Literacy Skills	<i>N</i>	Always <i>f</i> (%)	Often <i>f</i> (%)	Sometimes <i>f</i> (%)	Rarely <i>f</i> (%)	Never <i>f</i> (%)	<i>M</i>	<i>SD</i>
1. Easily locate the required information online to meet your needs	462	160(34.6)	199(43.1)	89(19.3)	9(1.9)	5(1.1)	4.08	.84
2. Determine the authenticity of information online	458	80(17.5)	180(39.3)	139(30.3)	43(9.4)	16(3.5)	3.57	.99
3. Save and organize the obtained online information for future use	451	163(36.1)	134(29.7)	108(23.9)	31(6.9)	15(3.3)	3.88	1.07
4. Use information ethically (Avoiding Plagiarism etc.)	453	136(30.0)	125(27.6)	121(26.7)	53(11.7)	18(4.0)	3.67	1.13
5. Share Information (i.e. files, report, article with your peers/friends)	459	155(33.8)	137(29.8)	113(24.6)	31(6.8)	23(5.0)	3.80	1.12

Never=1-Always= 5

More than half (Always=17.5%, Often= 39.3%) of the students claimed to be able to determine the authenticity of online information, while a very small percentage of the students (Rarely=9.4%, Never=3.5%) reported their inability to determine the authenticity of the information available online. The majority of the students (Always=36.1%, Often= 29.7%) reported that they were able to save and organize the obtained online information for future use; again a small number of students (Rarely=6.9%, Never=3.3%) reported their inability to save and organize the obtained online information for future use.

On the whole more than half of the students believed that they were able to use information ethically while the rest indicated their inability to do so. It can be concluded from the results in Table 2. that most of the young students reported that they were able to share knowledge with peers/friends, electronically, as 33.8% and 29.8% of students rated this statement always and often respectively.

The mean score in Table 2. describes that university students were often ($M=4.08$, $SD=.84$) able to easily locate their required information online to meet their information need. They were confident that they were often ($M=3.57$, $SD=.99$) able to determine the authenticity of online information. Similarly, it was found that university students were often ($M=3.88$, $SD=1.07$) able to save and organize their obtained online information for future use. They were often ($M=3.67$, $SD=1.13$) able to use information ethically and to share knowledge with peers/friends ($M=3.80$, $SD=1.12$).

Overall responses show students' self-perceived confidence is quite good that they often possess required information literacy skills. These findings are opposite to the previous findings reported from Pakistan. Rafique (2014) reported that even the faculty members have poor information literacy skills when he surveyed the University of Lahore in a study. Similarly, Kousar & Mahmood (2013) reported that engineering students did not possess information literacy skills good enough to help them in their university-level studies.

RQ 2. How young adults interact with digital contents?

To determine the onscreen reading patterns, students were asked about the frequency of use and their awareness level of functions and techniques associated with the onscreen reading format.

Table 2.

Frequency of using Functions and Techniques While Reading Onscreen

Techniques & Functions	N	Yes	No	Do not know about it
		<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)
1. "Highlight" in pdf files	508	333(65.6)	115(22.6)	60(11.8)
2. "Highlight / underline" in MS Word files	504	334(66.3)	121(24)	49(9.7)
3. "Commenting" in MS Word files	500	198(39.6)	249(49.8)	53(10.6)
4. "Commenting" in pdf files	505	123(24.4)	302(59.8)	80(15.8)
5. "Take notes" on paper	504	401(79.6)	88(17.5)	15(3)
6. "Take notes" on computer file (MS Word)	506	360(71.1)	122(24.1)	24(4.7)
7. "Bookmark"	504	315(62.5)	155(30.8)	34(6.7)
8. "Glossary / dictionary" lookups	504	366(72.6)	115(22.8)	23(4.6)
9. "Search/find" in pdf files	506	373(73.7)	101(20)	32(6.3)
10. "Search/find" in MS Word files	500	318(63.6)	152(30.4)	30(6)

Note-taking is recognized as a critical activity. Notes are essential for recalling what has been heard or seen and can promote reflection afterward (Nguyen, 2006). The current study reports that in the digital environment, a vast majority (79.6%) of the students tended to take notes on a separate paper while reading onscreen. Similar behavior was identified by Shabani, Kharaji, and Abedi (2012, p.13) when the majority of the students were found to take print of electronic documents for note-taking or take notes on a separate sheet of paper while reading on-screen (Vandenhoeck, 2013, p. 40). A large majority (71.1%) of the respondents were habitually taking

notes on separate computer files (MS Word). Fox (2005) similarly found that note-taking was very common amongst the students surveyed. However, digital note-taking was not pervasive despite the availability of laptops and other portable tools that support digital note-taking. It is also evident that in a digital environment note-taking on separate MS Word files is also a common practice among the majority (71.1%) of the students.

Table 2 shows that the majority (65.6%) of the university students used the “Highlight” function in pdf files, similarly, a good number of students (66.3%) use the “Highlight / Underline” function in MS Word files. The use of the “Commenting” function in pdf files (24.4%) and MS Word files (39.6%) is comparatively lower than that of the “Highlighting” function. While reading online, “Book Marking” was a common activity among the majority of them (62.5%).

“Glossary / Dictionary” lookups while reading onscreen was also common among the vast majority (72.6%). The “Search/Find” function in pdf files and “Search/Find” in MS Word files, was in the use of 73.3% and 63.6% of students respectively (Table 2.).

It can be concluded that use of highlighting, and search/find function was common while reading electronic documents, however, a smaller number of students used commenting function generally in MS Word and particularly while reading pdf files. The majority of the students also use glossary/dictionary lookups. It is worth mentioning here that the use of the “Highlight” function in pdf files, “Glossary/Dictionary lookups” and “Bookmarking” function is reported to be higher in the current study than earlier reported by Simon, 2001 (p.3).

Discussion and Conclusions

Overall responses show students’ self-perceived confidence was quite good and that they felt they possess the required information literacy skills. Previous studies show a low level of digital skills among digital information users (Ameen & Gorman, 2009; Rafique, 2014; & Kousar & Mahmood, 2013). However, the findings of one recent study (Mahmood & Saeed, 2014, p.5), are consistent with the findings of the current study.

Although the current study revealed satisfactory results about self-perceived digital information literacy skills level, however, the students were less inclined to utilize the annotation techniques associated with digital contents, as they reported the use of a separate sheet of paper for taking notes. The results of the study revealed that the use of a separate sheet of paper to record notes while reading from a screen, was a common practice among the majority (79.6%) of respondents;

far higher than any other form of digital annotation (“Comment” in pdf files at 24.4%, and “Comment” in MS word files at 39.6%). These results suggest that although students see annotation as important, they want it to have a physical quality. Rose (2011) paints a similar picture. The students are simply less aware of the techniques of digital annotation available to them or do not know how to use them. Taken as a whole, data from both the current and previous studies (Shabani, Kharaji & Abedi, 2012 p.13; Vandenhoeck, 2013 p.40) appears to signal a need for training in onscreen reading. If more students were aware of how they can interact with digital texts, they may feel more comfortable with reading in this medium which, regardless of their preference, they seem to have accepted.

Overall rates for digital annotation are low despite their relative simplicity, as are the rates for the ability to consolidate comments into the text itself, rather than having two separate documents. This may, in part be due to the fact that nearly half of the respondents do not use digital annotations. This suggests a gap in their knowledge that, if addressed, could make them more willing or confident to read from computer screens. It is worth mentioning here that the use of “Highlight” in pdf files, “Glossary/Dictionary Lookups” and “Bookmarking” is reported more frequently in the current study than what was reported by Simon, 2001 (p.3).

More importantly, their onscreen reading behavior shows that they lack few skills of using all features of electronic reading formats. Therefore, it could be expected that with proper training the readers could utilize electronic reading in much more effective manners.

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