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# Digital Reading Competency of Students: A Study in Universities in Kerala

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**ABSTRACT**

The purpose of this study was to gain insight into the digital reading competency of the students in universities in Kerala. Structured questionnaires were used to collect data from a representative sample of 525 students of the teaching departments of three prominent universities in Kerala. The findings revealed that a good number of the students have a medium level of digital reading competency. It is also noted that male students exhibited a high level of competency as compared with female students and also that there exists a significant relationship between digital reading competency and level of competency to use computer and other digital devices. This study will be useful to develop digital literacy education framework which will enhance student's digital reading competency.

**Keywords:** Digital reading; Online reading; e-Learning; Competency; Digital literacy; Students, University, Kerala

## 1. INTRODUCTION

Information and communication technology (ICT) has opened new horizons for the creation, storage and dissemination of information. The pace at which information sources are being produced and converted into electronic form is marvelous. Information from e-resources cannot be accessed and read in the same manner as printed sources were consulted previously. Sufficient knowledge about computers and retrieval techniques are desirable to effectively search and read e-resources.

In the digital environment, many individuals lean toward digital texts to printed ones, and have subsequently given rise to a type of reading, called on-screen reading[1]. To understand the on-screen reading, it is important to inspect the components of the process and to re-conceptualise the concept of reader-text-author[2]. On screen reading differs in contrast with reading printed text in terms of skills and process[3]. Other than those paper reading abilities, formulating keywords, assessing relationships between hyperlinks, choosing high-quality texts from online texts, incorporating hypertexts within open textual boundaries, and retrieving particular facts from Websites were identified as new skills for digital reading[4]. Technological advancement have in this manner created new opportunities as well as posed new difficulties and challenges for individuals forcing them to acquire new skills to benefit from these advancements[5].

Warschauer and Healey[6] take note of that in a world of information, search strategies are essential and a student need 'the ability to react and adapt to changes instead of training in a single way to approach a task'. Students need to build up the ability to find information in plenty of hypertexts, evaluates its credibility, and decide whether to accept the information, or continue searching for more relevant information. Furthermore, the increasing utilisation of digital libraries is promoting digital reading and forcing students to move beyond the domain of paper-based texts[7-9]. Bruce[10] develops this point by contending that with the proliferation of information needed for scholarly purposes, students are exposed not only to conventional text presentation but also to electronic texts. The main challenge for students is to acquire the digital literacy skills that will allow him/her entrance into the social, academic, and workforce environments of the 21st century[11].

It is essential to deepen the knowledge about factors and process that can support or hinder hypertext comprehension and how to prepare students to deal suitably with digital information. Students who possess higher education and digital literacy skills will doubtlessly have the ability to retrieve and read more pertinent and valuable information, which will then be translated into academic, commercial, political and social focal points. This study investigates the digital reading competency of students in the universities in Kerala.

## 2. LITERATURE REVIEW

Several research communities have started to explore the changes to literacy created by new technologies and the social practices they induce. Coiro[12] viewed this new literacy's as vital new strategies and dispositions, required by the Internet, that are fundamental for online reading comprehension, learning, and communication. McPherson[13] trust that the Internet or computer-based learning activities make reading more enjoyable. Such activities likewise motivate students to become active participants, encourage them to use critical reading skills, and improve students' reading fluency and understanding of content. McNabb[14], *et al.,* also pointed out

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that higher order literacy skills, such as organising, comparing, contrasting, and synthesising information, are crucial factors when students complete Internet-based activities.

As Murphy[15], *et al.,* have expressed, the techniques and strategies requisite for comprehending traditional printed text are not the same strategies required to comprehend computerised texts. According to Coiro[16], *et al.,* what it means to be literate has evolved from having the competence to access, evaluate and understand static printed texts to being able to access, find, evaluate, understand and utilise a dynamically rich variety of digital texts accessible through the Internet. Adeleke & Emehara[17] reported that less usage of e-resources is associated with the lack of searching skills and also there exists a significant relation between the use of e-resources and digital literacy skills. Leu[18], *et al.,* found no significant correlation, among seventh-grade students, between performance on a measure of offline reading comprehension and a measure of online reading comprehension for adolescents.

Shen[19] reveal that English as Foreign Language college students reading habits has changed from paper-based to Web-based reading. Shariman[20], *et al.,* reported that the Malaysian students' digital literacy competency depended on several factors like English language proficiency, and the design of multimodal forms in digital contents. Pattuelli & Rabina[21] found that the portability of the device and its convenience of use anywhere and anytime are pivotal for enhancing the students reading experience.

## 3. METHODOLOGY

The statistical population comprises the post graduate students of the University of Kerala, University of Calicut and Mahatma Gandhi University. The aggregate number of post graduate students in the teaching departments of the universities was 3300. A representative sample of 525 students was selected with stratified random sampling. Structured questionnaire was the main instrument for data collection. The questionnaire was pre-tested before final application. Out of 525 copies of questionnaire distributed, a total of 426 questionnaires were returned back with a response rate of 81 per cent. Among the respondents, 217 students were male and the remaining 209 were female students. Data collected were coded and analysed with Statistical Package for Social Sciences (SPSS) version 21. Simple percentages, Mean, Standard Deviation and Chi-square tests, Correlation and Mann-Whitney U tests were employed for analysing the data and testing hypotheses.

## 4. RESULTS AND DISCUSSIONS

### 4.1 Experience of Use of Computer

Chauhan & Lal[22] emphasised that new technologies not only influence students learning and studying in the classroom, but also affect their reading behaviours. Skilled and experienced students have knowledge about the structures and functionalities in computer environment that helped in locating, accessing, and managing information while reading online. The students were asked to indicate their experience of use of computer and the responses are presented in Table 1.

**Table 1. Experience of use of computer**

| Experience (Years) | Responses (n=426) | | |
|---|---|---|---|
| | Male | Female | Total |
| Less than one year | 10 (4.6 ) | 11 (5.3 ) | 21(4.9) |
| 1-3 years | 64 (29.5) | 72 (34.4) | 136 (31.9) |
| 4-6 years | 73 (33.6) | 74 (35.4) | 147 (34.5) |
| 7-9 years | 38 (17.5) | 23 (11) | 61 (14.3) |
| More than 9 years | 32 (14.7) | 29 (13.9) | 61 (14.3) |
| Total | 217 (100) | 209 (100) | 426 (100) |
| Chi-square = $4.212^{ns}$ p-value = 0.378 | | | |

*ns-non Significant at 0.05 level*

By analysing the results, it is clearly seen that a sum total of 147 students (male, 33.6, female, 35.4) have a computer experience of 4-6 years and around 32 per cent of both genders have an experience of 1-3 years. At the same time about 14.3 per cent of university students have a good experience of use of computer, i.e. 7-9 years and also more than 9 years. To test the significance of variable comprising male and female students in their experience of use of computer Chi-square test conducted and found that there is no significant association among them. Substantiating these results, Sacks[23], *et al.* in a study of high school students found that their attitudes towards computer and their use of computer tended to vary by gender. This difference however tended to diminish with computer experience.

### 4.2 Competency in Computer and Other Digital Devices

Unlike traditional text forms which commonly include a blend of two sorts of media, print and two dimensional graphics, digital text integrate a range of symbols and multi-media formats including icons, animated symbols, audio, interactive tables, virtual reality environments and many more[3]. Computer and other digital devices assume a noteworthy role in the way readers are reading around the world and serve perhaps as the most comprehensive source of input[24]. Adequate knowledge and skills about computer and other digital devices are desirable to effectively search these electronic information sources. Table 2 illustrates the student's level of competency in the computer and other digital devices.

Results clearly revealed that nearly 50 per cent of the students have very high competency to use mobile phone. In the mean time more than 40 per cent of them reported a high level of competency in devices like desktop computer, laptop computer and mobile phone. Goldhammer[25], *et al.* found strong positive relations between fundamental computer skills and online reading for the German sample of the PISA 2009 field test. Basic computer skills accounted for 38 per cent of the variance in digital reading.

A score for level of expertise in use of digital devices is calculated by adding the scores of level of expertise to each digital device. For each device, a score of 0, 1, 2, 3, and 4 were given to the response very low, low, moderate, high and very high respectively. As there are 10 devices total score of expertise ranges in between 0 to 40. This expected range is divided into three groups. Low level with scores ranges in

**Table 2. Competency in computer and other digital devices**

| Devices | Responses (n=426) (in percentage) | | | | |
|---|---|---|---|---|---|
| | Very low | Low | Moderate | High | Very high |
| Desktop computer | --- | 4 (0.9) | 174 (40.8) | 185 (43.4) | 63 (14.8) |
| Laptop computer | --- | 10 (2.3) | 153 (35.9) | 200 (46.9) | 63 (14.8) |
| Netbook/Notebook | 56 (13.1) | 125 (29.3) | 164 (38.5) | 63 (14.8) | 18 (4.2) |
| Tablet | 42 (9.9) | 94 (22.1) | 153 (35.9) | 111 (26.1) | 26 (6.1) |
| Mobile phone | 1 (0.2) | 4 (0.9) | 35 (8.2) | 189 (44.4) | 197 (46.2) |
| E reader | 81 (19) | 173 (40.6) | 136 (31.9) | 28 (6.6) | 8 (1.9) |
| I-Pod | 81 (19) | 137 (32.2) | 155 (36.4) | 42 (9.9) | 11 (2.6) |
| Printer | 34 (8) | 85 (20) | 201 (47.2) | 90 (21.1) | 16 (3.8) |
| Scanner | 41 (9.6) | 121 (28.4) | 175 (41.1) | 74 (17.4) | 15 (3.5) |
| LCD/Multimedia projector | 36 (8.5) | 115 (27) | 173 (40.6) | 89 (20.9) | 13 (3.1) |

between 0 to 12, medium level with scores ranges in between 13 to 26 and high level with scores ranges in between 27 to 40. Classification according to the level of expertise is given below in Table 3, shows that majority of the students have a medium level of competency in the use of computer and other digital devices.

Gender has turned into a significant issue related with the use of computer and other advanced gadgets. As per the results depicted in Table 3, approximately 77.5 per cent of female students and 65 per cent of male students reported that they have medium level of competency to use computer and other digital devices. A high level of competency is reported by 32.7 per cent of the male students, and only a few per cent (6.7) of female students have reported the same. Substantiating these results, Campbell[26] and Shashaani[27] claimed that compared to female students, male students had more access to computers, felt more confident with their computer skills and showed more positive attitude toward computers.

**Table 3. Level of competency in computer and other digital devices**

| Competency level | Responses (n=426) | |
|---|---|---|
| | Male | Female |
| Low | 5 (2.3) | 33 (15.8) |
| Medium | 141 (65) | 162 (77.5) |
| High | 71 (32.7) | 14 (6.7) |
| Total | 217 (100) | 209 (100) |
| Mean ± SD | 23.54 ± 5.84 | 17.84 ±5.65 |
| Chi-square = 60.182**; p-value < 0.001 | | |

*** Significant at 0.01 level*

Further, the data subjected to Chi-square test to test the significance of variables comprising level of competency in computer and other digital devices and gender. Chi-square value is found to be significant as the p-value is less than 0.001. Hence null hypothesis is rejected and accepted that there is significant difference in the level of competency among male and female students. Mean score for level of competency in digital devices is higher in male (23.54) than female (17.84) students. Hence it can be concluded that the competency in computer and digital devices is higher in male students compared to female students.

### 4.3 Digital Reading Competency

With the rapidly developing information technologies, reading on the screen is transforming into an absolute necessity; on the grounds that the texts are transferred to the computer pages and they are published through computers. Table 4 sought to determine, whether there exists any gender difference in the digital reading competency of the students. It is worth mentioning that the male students are comparatively more competent than the female students in all the following activities mentioned below related to digital reading competency. Index of competency was compared between male and female with Mann Whitney U test. Z-value is found to be significant either at 0.05 level or at 0.01 level. This shows that there exists significant difference in the level of competency among male and female students. These findings are consisted with the study results of Houtz & Gupta[28]. They found significant gender differences in the way female and male rated themselves in their ability to computer technology skills.

A score for level of competency in digital reading is calculated by adding the scores of level of competency to each aspect. For each aspect, a score of 0, 1, 2, 3, and 4 were given to the response very low, low, moderate, high and very high respectively. As there are 28 aspect total score of level of competency in between 0 to 112. This expected range is divided into three groups. Low level with scores ranges in between 0 to 36, medium level with scores ranges in between 37 to 74 and high level with scores ranges in between 75 to 112. Classification according to the level of competency is given below in Table 5 shows that a majority of the students (60.1) in the universities have a medium level of competency in digital reading.

Classification based on level of competency in digital reading among male and female students analysed results are shown in Table 5. From the results it can be inferred that male students exhibited a high level of competency as compared the female students. It is also seen from the table that majority (77.5) of the female students have medium level of competency in digital reading. To test the significance of variable comprising classification based on level of competency in digital reading among male and female, Chi-square test conducted and the results shows that there is significant association between male and female in their level of competency in digital reading since the p-value is less than 0.01.

Comparing the mean scores with those from male (74.21), the female students have a lower mean scores (61.67) for the competency in digital reading. This suggests that the difference among the male and female students in their level of digital

**Table 4. Digital reading competency of the students**

| Aspects | Responses (percentage) | | Z-value | p-value | Overall |
|---|---|---|---|---|---|
| | Male | Female | | | |
| To create a basic text document | 78.50 | 68.75 | 5.023** | <0.001 | 73.75 |
| To change monitor brightness and contrast | 76.75 | 68.50 | 4.117** | <0.001 | 72.75 |
| To change font size and font style in a document | 79.25 | 75.00 | 2.259* | 0.024 | 77.00 |
| To copy, cut, paste or delete text in a document | 81.50 | 77.25 | 2.012* | 0.044 | 79.50 |
| To transfer files between computer and other digital devices | 73.25 | 65.25 | 3.291** | 0.001 | 69.25 |
| For using a web browser | 75.50 | 69.25 | 2.899** | 0.004 | 72.50 |
| To search for information online using search engines | 79.25 | 73.50 | 2.877** | 0.004 | 76.50 |
| For sending/reading e-mails | 82.25 | 73.25 | 4.334** | <0.001 | 77.75 |
| To download and save files from the web | 80.50 | 72.75 | 3.741** | <0.001 | 76.75 |
| For using storage devices (CD,DVD, flash memory) | 74.00 | 62.25 | 5.581** | <0.001 | 68.25 |
| To convert documents to PDF format | 58.50 | 43.75 | 7.029** | <0.001 | 51.25 |
| To use comment/highlight function when reading PDF files | 54.25 | 44.25 | 4.643** | <0.001 | 49.25 |
| To use search/find function when reading PDF files | 60.50 | 50.25 | 4.421** | <0.001 | 55.50 |
| For using Social Networking Sites (eg. Facebook) | 81.00 | 71.00 | 4.498** | <0.001 | 76.00 |
| For using social bookmarking (eg. Delicious, Diigo) | 41.50 | 25.50 | 7.29** | <0.001 | 33.75 |
| To locate and read blogs | 53.00 | 33.75 | 8.041** | <0.001 | 43.75 |
| For using Really Simple Syndication (RSS) and feed readers (Google Reader, Blog lines) to manage feeds | 38.75 | 26.25 | 5.795** | <0.001 | 32.50 |
| To use any kind of anti-virus and anti-spam software | 63.75 | 48.75 | 6.414** | <0.001 | 56.50 |
| For scanning, scrolling, searching--using menu bars and keywords | 76.25 | 63.25 | 6.144** | <0.001 | 70.00 |
| For using hyperlinks in websites and online interfaces for navigation | 65.50 | 50.75 | 6.174** | <0.001 | 58.25 |
| For tracing on screen with finger or mouse to identify titles or words | 79.50 | 68.50 | 5.335** | <0.001 | 74.00 |
| For using online dictionaries | 70.75 | 58.50 | 5.138** | <0.001 | 64.75 |
| For relating and comparing one digital content site to other known digital content site | 53.75 | 39.75 | 6.363** | <0.001 | 47.00 |
| For identifying main ideas and background knowledge of digital content site | 52.50 | 41.25 | 5.383** | <0.001 | 47.00 |
| For downloading e-books and audio books and performs troubleshooting on e-readers and other handheld reading devices | 42.00 | 32.50 | 4.262** | <0.001 | 37.50 |
| To evaluate web -based content sites for quality and credibility | 52.00 | 37.50 | 6.854** | <0.001 | 44.75 |
| To manipulate and store information and content for easier retrieval | 63.25 | 50.00 | 6.36** | <0.001 | 56.75 |
| For using variety of search strategies (keyword, Boolean operators, phrase searching) | 67.50 | 50.75 | 7.98** | <0.001 | 59.25 |

reading competency is statistically significant.

**Table 5. Level of digital reading competency of the students**

| Level of competency | Responses (n=426) | |
|---|---|---|
| | Male | Female |
| Low | 2 (0.9) | 7 (3.3) |
| Medium | 94 (43.3) | 162 (77.5) |
| High | 121 (55.8) | 40 (19.1) |
| Total | 217 (100) | 209 (100) |
| Mean ± SD | 74.21 ± 15.78 | 61.67 ±14.58 |
| Chi-square = 61.463**; p-value < 0.001 | | |

*** Significant at 0.01 level*

### 4.4 Need of Training for Digital Reading

The ability to find and locate information on the Internet is essential to Web based reading. Henry[29] depicts the location of information as a critical 'gatekeeper' skill that to a great extent determines the effectiveness of online reading comprehension. The respondents were asked whether or not they required training to improve their digital reading skills, and the responses are presented in Table 6.

It is found that more than 50 per cent of the female students indicated their interest for training in digital reading, but only 29 per cent of male reported their interest in training. Confirmed to this statement, Zhang[30], *et al.,* reported the results of a questionnaire survey among the students and teachers in Dalian Nationalities which proposed that the users should be

supported with more training keeping in mind the end goal to enhance their information seeking skills while using electronic resources. Further the Chi-square test results reveal that there is significant difference among male and female students in their need of training for digital reading, since the p-value is less than 0.01.

**Table 6. Need of training for digital reading**

| Need of Training | Responses (n=426) | | |
|---|---|---|---|
| | Male | Female | Total |
| Yes | 63 (29) | 113 (54.1) | 176 (41.3) |
| No | 124 (57.1) | 67 (32.1) | 191 (44.8) |
| Not know | 30 (13.8) | 29 (13.9) | 59 (13.8 |
| Total | 217 (100) | 209 (100) | 426 (100) |
| Chi square = 31.093**; p-value < 0.001 | | | |

*** Significant at 0.01 level*

### 4.5 Confidence in Digital Reading

Readers who are confident in online reading will extract the contents of hypertext pages and furthermore meaningfully link them according to a specific reading goal[31]. When trying to find out the level of confidence in digital reading among male and female students, Table 7 below identifies that more than 50 per cent of male students said that they are good in their confidence in digital reading**.**

**Table 7.Confidence in digital reading**

| Level of Confidence | Responses (n=426) | | |
|---|---|---|---|
| | Male | Female | Total |
| Excellent | 26 (12) | 9 (4.3) | 35 (8.2) |
| Good | 109 (50.2) | 68 (32.5) | 177 (41.5) |
| Average | 66 (30.4) | 96 (45.9) | 162 (38) |
| Poor | 15 (6.9) | 33 (15.8) | 48 (11.3) |
| Very poor | 1 (0.5) | 3 (1.4) | 4 (0.9) |
| Total | 217 (100) | 209 (100) | 426 (100) |
| Chi square = 30.921**; p-value < 0.001 | | | |

*** Significant at 0.01 level*

Average level of confidence is reported by nearly half per cent of the female students. It is also interested to note that compared to female students, 12 per cent of male students reported their level of confidence as excellent. By applying Chi-square test, the p-value of 0.001 exhibited in the Table 7 indicates a significant association at one per cent level between the gender and their level of confidence in digital reading. This reveals that difference among male and female students regarding their level of confidence in digital reading is statistically significant. On the whole it is noted that the male students have high confidence in digital reading than female students.

In the effort made to test the relation between level of competency to use computer and other digital devices and digital reading competency, Correlation coefficient worked out and significance was tested and the results are given in Table 8.

**Table 8. Relation between level of competency of use of computer and other digital devices and digital reading competency**

| Variable | Correlation | p-value |
|---|---|---|
| Level of expertise and digital reading competency | 0.727** | < 0.001 |

*** Significant at 0.01 level*

The correlation value of 0.727 and p-value of 0.001 indicate that there exists a significant relation between the level of competency to use computer and other digital devices and digital reading competency at 0.01 level of significance. That implies that the level of competency to use computer and other digital devices is positively correlated with digital reading competency. These findings underline that if students need to be proficient in reading digital text, it is essential to support them in mastering skills in dealing with ICT and in developing effective navigational strategies by providing appropriate learning opportunities and directing them through challenges.

## 5. CONCLUSIONS

Good readers with high level of competency in computer, digital devices and effective strategies for deciding on the convenience and usefulness of Web-based information are able to locate, evaluate, and synthesize Web-based information. In other words, if students have difficulties with linear reading or lack basic computer skills, they will struggle to find and relate relevant information to other information, and are likely to have problems with understanding hypertexts[32].

It is found that a good number of the students in the universities of Kerala showed a medium level of competency. It is also noted that male students exhibited a high level of competency as compared to female students. Results also depicted that there exist significant relationship between digital reading competency and level of competency to use computer and other digital devices. In the digital environment the knowledge, expertise and confidence with computer and other advanced digital devices are currently a benefit for students whose aim is utilise an assortment of information sources.

For improving the digital reading competency of students, orientation programs like digital literacy training should be provided. Organising an online information searching workshop can help the students in searching the exact information, so the students can get an idea of how to refine a search strategy. Educators should assist the students to acquire the needed digital literacy skills, to effectively access, retrieve and read the digital information, and benefit from the myriads of digital resources available to them to improve the quality of their academic and research work.

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