EXPLORING THE NEXUS BETWEEN INTERNET USE AND UNDERGRADUATE STUDENTS PERFORMANCE IN READING COMPREHENSION TEST: A CASE STUDY OF TWO UNIVERSITIES IN ANAMBRA STATE

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Abstract
The study explores the nexus between internet use and undergraduate students' performance in reading comprehension tests. The population consisted of undergraduate students of two universities in Anambra State: Nnamdi Azikiwe University, Awka and Chukwuemeka Odumegwu Ojukwu University, Uli. The sample size was 200 male and female students randomly selected from the two universities. A well-structured questionnaire and a reading test made up of a reading passage and comprehension questions were administered to respondents. The data collected from the questionnaire were analyzed using arithmetic mean while hypotheses were tested with Analysis of Variance (ANOVA). The result of the findings showed that the reading comprehension of undergraduate students that use the Internet to a high extent is 79.49 while that of those that use it to a low extent is 71.81, thus, a mean difference of 4.68 in favour of high internet users. This suggested that high Internet users scored higher and performed better in the reading comprehension test irrespective of location. The study further revealed that there was no statistically significant interaction between gender and internet use on students' reading test. This is shown by $f = .84$, $P = .36$. The study therefore recommended that undergraduate students should be encouraged to always use the Internet as a tool to tap valuable reading resources which can assist in the promotion of autonomous learning and make them more independent and resourceful.

Key Words: Nexus, Internet, Reading Comprehension, Performance, Gender.

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Introduction
Reading is one of the most important activities of life through which one enters into the life and experiences of others and increases one's knowledge, scope of experience and enjoyment. It is principally through reading that people obtain knowledge. People who can neither read nor write are described as illiterates and such people are often limited to the knowledge gained from oral communication many activities of ordinary life require the ability to read. Moreover, reading enriches one's understanding of how language is used, thereby improving one's spoken and written language.

The nature of literacy is rapidly changing as new technologies emerge (Leu and Kinzer 108). Today the definition of literacy has expanded from traditional notions of reading and writing to include the ability to learn, comprehend and interact with technology in a meaningful way (Coiro458). The Internet in particular provides new text formats, new purposes for reading and new ways to interact with information that can confuse and overwhelm people.

Reading comprehension is the process of making sense of text. It is a complex, multifaceted activity that requires the reader's thinking and problem-solving skills. Comprehension is a very vital component of reading and by all standards an important factor of good reading habit because the purpose of any form of reading is comprehension. Ruddel says it is the bottom line of any form of reading (94).

The Reading Study Group's Report defined reading comprehension as “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (11). It proposed a developmental heuristic of reading comprehension that includes three elements: “the reader who is doing the comprehending, the text that is to be comprehended and the activity in which comprehension is embedded. These three elements occur within the socio-cultural context of the reader’s classroom, home and neighborhood and they help a reader to interpret information and create personal meaning. The Internet forces us to expand our understanding of each of these elements by considering new aspects of comprehension that are clearly related to traditional comprehension areas (e.g. locating main ideas, summarizing, inferencing and evaluating) but
require fundamentally new thought process. The Internet provides opportunities for interaction with new text formats (e.g. hypertext and interactive multiple media that require new thought processes).

However, some researchers are of the view that within internet environments, many readers are easily frustrated when not satisfied instantly in their rapid search for immediate answers and may adopt a “snatch and grab philosophy... not apparent in print text environments” (Sutherland-Smith 664).

The present study therefore seeks to address important questions about the relationship between internet use and undergraduate students’ performance in reading comprehension tests. This is significant as it will help students as well as teachers to use the internet effectively for their literacy future.

**Research Questions**

1. What is the influence of internet use on the reading comprehension of undergraduate students of different locations?
2. What is the influence of internet use on the reading comprehension of male and female undergraduate students?

**Null Hypothesis**

1. There is no significant interaction between location and internet use on students’ reading comprehension.
2. There is no significant interaction between gender and internet use on students’ reading comprehension.

**Literature View**

Presently, new forms of reading and writing are appearing as the Internet and other new technology for literacy enter our classroom (Leu 310). New ICTs provide a variety of new texts which introduce new supports as well as new challenges that can have a great impact on an individuals’ ability to comprehend what he or she reads (Coiro 458). The last few decades have witnessed a shift in becoming literate. Nowadays, particularly, becoming a proficient reader depends on the degree to which we have new literacy
skills that are required for reading and comprehending the texts produced. Another study by Lopez (901) focused on improving students' use of whiteboard technology and the effects of it on reading comprehension. The results indicated that increasing the students' literacy skills is related to effectively using whiteboard technology.

Also, Coiro investigated the extent to which new reading comprehension proficiencies may be required when adolescents read for information on the Internet. The research findings showed that increasing the awareness of the students regarding how to locate, critically evaluate, synthesize and communicate information using the Internet made significant contribution to their reading comprehension level. In another study, Anunobi and Mbagwu investigated the prevalence of gender discrepancy in internet use in Nigeria. From the study, they discovered the following: The female folks are almost at par with males in internet use, but most female users belong to very young age group most of which possess secondary school certificates and National Certificates of Education or their equivalents (90-102).

However, females with PhD have very good representation. Females visit the internet less frequently but stay longer when they do. Contrary to the result that females are almost at equal footing with the males in internet use, the researcher is of the opinion that the males are likely to use the Internet more than the females. The opinion was based on the variables that females are less technologically-oriented, have more domestic pressure and have some cultural barriers to use of such technology contrary to their male counterparts. Encouraging them towards the positive use of the Internet will make positive and significant contributions to their performance in reading comprehension tests (Chase and Laufenberg 535; Henry 614).

The study conducted by Dreyer and Nel (2003) showed that the students who received strategic reading instruction supported by technology had higher marks on reading comprehension texts compared to the students in the control group. Significant learning and motivational gains for students have been extensively documented when new literacies are integrated into official literacy curricular. Educational initiatives have aimed to reduce the disconnection between students' experience, identities, values and patterns of engagement with new literacy skills (Bluffin and North 2007).
Research Methodology
The target population for this study is the fourth year undergraduate students of two universities in Anambra State namely: Nnamdi Azikiwe University, Awka and Chukwuemeka Ojukwu University, Uli. The choice of the two universities was considered appropriate because one is a federal university located at an urban area while the other is a state university located at the rural area. The reason for the choice of the 400L undergraduate students was that most of them have spent four (4) years in the university and some are in their final year of study in the university. They have become accustomed to the rigors of academic work and are also conversant with the use of the Internet. Two hundred male and female students were randomly selected using stratified random sampling technique. A well-structured questionnaire was administered to elicit vital information from the respondents. Also, a reading comprehension test made up of a comprehension passage and questions were also administered to the respondents to buttress the findings from the questionnaire and further explore the relationship between internet use and students' performance in reading comprehension text. Data collected were analysed using arithmetic mean while hypotheses were tested with Analysis of Variance (ANOVA).

Data Presentation and Analysis

Research Question One
What is the influence of internet use on reading comprehension of undergraduate students of different locations?
Table 1: Mean and Standard Deviation Scores of Undergraduate Students on Reading Comprehension Based on Internet Use and Location

<table>
<thead>
<tr>
<th>Extent of Internet Utilization</th>
<th>Location</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
</tr>
<tr>
<td>High</td>
<td>Urban</td>
<td>83</td>
<td>77.30</td>
<td>9.82</td>
<td>74</td>
<td>75.59</td>
<td>10.50</td>
<td>157</td>
<td>76.49</td>
<td>10.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>74</td>
<td>75.59</td>
<td>10.50</td>
<td>26</td>
<td>70.69</td>
<td>13.89</td>
<td>43</td>
<td>71.81</td>
<td>14.86</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>157</td>
<td>76.49</td>
<td>10.15</td>
<td>100</td>
<td>75.49</td>
<td>11.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The result in table 1 shows that the mean reading comprehension of undergraduate students that use internet to a high extent is 76.49 while those that use it to a low extent has a mean reading comprehension score of 71.81. This indicates a mean difference of 4.68 in favour of students that utilize internet highly. This suggests that high utilization of the Internet influences these students positively by increasing their reading comprehension. As shown by the mean reading comprehension for students in urban area (Mean = 77.30) and those in rural (Mean = 75.59), this positive influence of internet utilization on reading comprehension is evident for students in both urban and rural areas when compared to low users in urban (Mean = 73.53) and rural (Mean = 70.69). However, urban low users have 2.84 points ahead of rural low users. This is an indication that students in urban areas are still ahead of those in rural areas in reading comprehension irrespective of their belonging to same category of low users of the Internet.

Research Question Two
What is the influence of internet use on reading comprehension of undergraduate students of different gender?
Data in table 2 shows that the mean reading comprehension scores of undergraduate students that use internet to a high extent is 76.49 while low users had mean reading comprehension score of 71.81. This indicates a mean difference of 4.68 in favour of students that utilize internet highly. This suggests that high utilization of internet influences these students positively by increasing their reading comprehension scores. In terms of gender, the mean reading comprehension for male students is (76.63) while that of female students is 76.32. This suggests that both gender belonging to the high users benefitted equally. However, male students in low user category had a higher mean reading comprehension than female students in the same category as shown by a mean difference of 3.92 (74.00 - 70.08). This suggests that, although both belong to the same category of internet users, male students were slightly better than their female counterparts in reading comprehension.

**Hypothesis one:** There is no significant interaction between location and internet use on students reading test.
Table 3: Summary of Analysis of Variance of Students’ Mean Achievement Scores in Reading Comprehension by Internet Utilization and Location

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>Df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>718609.18</td>
<td>1</td>
<td>718609.18</td>
<td>5600.94</td>
<td>.00*</td>
</tr>
<tr>
<td>Internet Utilization</td>
<td>612.47</td>
<td>1</td>
<td>612.47</td>
<td>4.77</td>
<td>.03*</td>
</tr>
<tr>
<td>Location</td>
<td>168.06</td>
<td>1</td>
<td>168.06</td>
<td>1.31</td>
<td>.25</td>
</tr>
<tr>
<td>Internet Utilization*location</td>
<td>10.40</td>
<td>1</td>
<td>10.40</td>
<td>.08</td>
<td>.78</td>
</tr>
<tr>
<td>Error</td>
<td>25147.08</td>
<td>196</td>
<td>128.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26083.98</td>
<td>199</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no statistically significant interaction between students’ internet use and location on students’ reading comprehension, F = .08, P = .78. The null hypothesis was not rejected. This was presented in figure 1 shown below:
Fig 1: Students Reading Test by Internet Use and Location
There is no significant interaction between gender and internet use on students' reading comprehension.

**Hypothesis Two:** There is no significant interaction between gender and internet use on students' reading comprehension.

Table 4: Summary of Analysis of Variance of Students' Mean Achievement Scores in Reading Comprehension by Internet Use and Gender

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>Df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>732534.59</td>
<td>1</td>
<td>732534.59</td>
<td>5702.59</td>
<td>.00*</td>
</tr>
<tr>
<td>Internet Utilization</td>
<td>651.98</td>
<td>1</td>
<td>651.98</td>
<td>.84</td>
<td>.36</td>
</tr>
<tr>
<td>Gender</td>
<td>148.20</td>
<td>1</td>
<td>148.20</td>
<td>.84</td>
<td>.36</td>
</tr>
<tr>
<td>Internet Utilization*Gender</td>
<td>108.11</td>
<td>1</td>
<td>108.11</td>
<td>.03</td>
<td>.28</td>
</tr>
<tr>
<td>Error</td>
<td>25177.45</td>
<td>196</td>
<td>128.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26083.98</td>
<td>199</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no statistically significant interaction between gender and internet utilization on students' reading comprehension, $F = .84$, $P = .36$. The null hypothesis was not rejected.
The non-significant interaction was depicted better in the figure 2 shown below:

![Estimated Marginal Means of Reading Comprehension Score](image)

Fig 2: Students Reading Comprehension by Internet Use and Gender

**Discussion**

**Research Question one:** What is the influence of internet utilization on reading comprehension of undergraduate students of different locations? The analysis in table I shows that the mean reading comprehension scores of undergraduate students that use the Internet to a high extent is 76.49 while those that use it to a low extent have a mean reading comprehension score of 71.81. This indicates a mean difference of 4.68 in favour of students that utilize the Internet highly. This suggests that high utilization of the Internet enabled the students to perform highly in the comprehension test.
This is shown by the mean reading comprehension score for students in urban area (mean = 77.30) and those in the rural area (mean = 75.59). This positive influence of internet utilization on reading comprehension was evident for students in both urban and rural areas when compared to low users (urban, mean = 73.53) and (rural, mean = 70.69). However, urban low users have 2.84 points ahead of rural low users. This is an indication that students in urban areas are still ahead of those in rural area in reading comprehension irrespective of their belonging to same category of low users of internet.

In terms of gender, table 2, (Research question 2) indicates that the mean reading comprehension score for male respondents is (76.63) while that of female respondents is (76.32). This shows that high users belonging to both gender performed equally high in the reading comprehension test and benefitted equally from the Internet. However, male students in low user category had a higher mean reading comprehension score than female students in the same category as shown by a mean difference of (3.92) that is (74.00-70.08). This suggests that although both belong to the same category of internet users, male students were slightly better than their female counterparts in reading comprehension.

It is thus clear from the foregoing that literacy involves the ability to learn, comprehend and interact with technology in a meaningful way. The Internet in particular provides new text formats, new purpose for reading and new opportunity to learners to get familiar with informational text structures. The vast amount of information available on the Internet enables learners to decode vocabulary, learn comprehension skills which increase their interest in reading, enables them tackle comprehension tasks and answer comprehension questions effectively.

The results of the findings agree with the new Literacies theory. According to Leu (330) five processing practices occur during reading comprehension. These include: reading to identify important questions, reading to locate information, reading to critically evaluate information, reading to synthesize information and reading to communicate information. Leu pointed out that within these five areas reside the skills, strategies and dispositions that are distinctive to online reading comprehension as well as others that are
also important for offline reading comprehension.

Hypothesis one: There is no significant interaction between location and internet utilization on students’ reading comprehension scores. Table 3 shows a summary of Analysis of variance (ANOVA) of students’ mean achievement scores in the reading test by internet utilization and location. The study revealed no statistically significant interaction between student’s internet utilization and location on students’ reading test. This is because high users of the internet in both urban and rural areas scored high in the reading test while low users in both locations scored low in the reading test. This is shown by, $F=0.08$, $P=78$: Thus the null hypothesis was not rejected. This was presented in figure 1.

The results of the study also revealed that those who performed better and scored higher in the reading comprehension test were the high internet users who benefitted from the reading strategies provided by the internet.

Conclusion and Recommendations
The study concludes from the overall analysis that the extent of Internet use is high for both gender and locations. This has more positive influence on the respondents because the high internet users performed better and scored higher than the low internet users in the reading comprehension texts. The study, therefore, advocates the use of the Internet as an effective tool in improving positive reading comprehension skills among students.

The findings of the study should assist the university authority, especially the English language and the computer science departments to look into service matters pertaining to accommodating the reading habits of students. For instance, the high percentage of reading time that take place at night may call for the respective authorities to consider opening more reading areas that operate for longer hours. A full 24 hours of computing service may also allow students to use the internet at times more convenient to them (e.g. evenings), since the day time is fully occupied with classes. This practice will go a long way to enhance the reading habits of the students.

Lecturers should encourage students to give enough time to personal study on the Internet. Most students look up to their lecturers’ advice. This will help to add value to their academic information. Lecturers should give
information about web sites where students can get unlimited education material information.

There is need to establish more commercial cyber cafes, community information centres in towns and information kiosks in villages to overcome the problem of lack of internet facilities in the rural areas. The rural areas should not be ignored in any condition as it can widen the gap of digital divide. Thus, the library institution of the 21st century can participate as an alternative not only to offer information sources but also to promote multiple reading, i.e., to encourage the integration of several complementing media that the reader can handle simultaneously and make the experience of reading a combination of both pleasure and knowledge.

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