Data Literacy- The Technology Proficiency among Higher Education Students

Dr. Fathima Jaseena M.P.M, Salih Moosa
Assistant Professor
Farook Training College.
Corresponding Author: Dr. Fathima Jaseena M.P.M

Abstract: In the present scenario development of society is depending up on quality of the research development of any area. Also phenomenon and evaluation are often related and represents as data. Thus manipulating and interpreting data from the view of research is highly relevant in modern society. We all know that education is the investment for future society. Studying about data literacy among young post graduate students is very significant towards progress of respective subject of that society. Data literacy plays a key role in developing knowledge of subject including science, arts, commerce and language. The aim of the study is to measure the level of data literacy by using Data Literacy Test on a sample of 600 students & result got that data literacy among students is average.

Keywords: Data Literacy, Data manipulation, Post Graduate Students.

I. Introduction

Educational research is scientific field of study that examine education and learning and the human attributes, interactions, organizations and instructions that shapes educational outcomes. The basic for each educational research is scientific method. Scientific method uses directed question and manipulation of variables to systematically find information about teaching learning experiences. In Kerala we have 100% percentage literacy. But Most of the people who are educated also lacking data literacy, digital literacy and information literacy etc. Literacy is the one of the prominent area in educational research. UNESCO defines literacy as "ability to identify, understand, interpret, create, communicate and compute using printed and written materials associated with various text".

II. Need of The Study

In present contexts, data literacy has prominent role. It is the ability to comprehend, create and communicate data and is the first level of tri level literacy, fluency, mastery skills. Data literate people have the knowledge, understanding and skills to connect people to data. It is an essential ability required in the global knowledge base economy; the manipulation of data occurs in daily processes across all sectors and discipline. An understanding of how decision are informed by data, and how to collect, evaluate and apply this data in support of evidence-based decision making and will increasingly be required in knowledge economy jobs as data literacy spans both qualitative and quantitative data and is enabled by a broad range of data related capabilities and learning outcomes. Even in everyday life, data collection can be important. For example we can see that Bakers often keep diaries when they are re learning how to bake a new type of biscuit. Gardeners keep a log about the growth of their gardens, and birdwatchers keep track of where and when they see what types of birds and what the weather condition where. Drivers keep track of vehicle message, and homeowners keep track of their electrical bill month to month.

Most of the people possess high qualifications. But they do not have enough ability to deal with more data. So it hinder them interpret and communicate by using large number of data, in various opportunities.

We can find less research studies on data literacy especially in post graduate students. But this study provides a chance for knowing information about data literacy.

III. Theoretical Views

Michael Bowen and Anthony Bartley Said that "Data literacy is important For your students because data Are used to argue and persuade People to, among other things, vote For political agendas or lease a Car. An improved understanding of data practices means that better Questions can be asked"
American library association identified six significant themes to consider about data literacy which is
given as follows

1. **Statistical Literacy**
   Students must critically “read,” contextualize, and interpret raw and synthesized data. Discerning
   Correlation from causation; recognizing the difference in the meaning of mean, median, and
   Mode; understanding what margin of error signifies in polling data; and recognizing potential biases in collected
   data, among other skills, are critical for readings scholarly research, understanding arguments in popular media,
   and interpreting government documents.
   For example: Statistics flood news articles, Face book feeds, and scholarly journals etc

2. **Data Visualization**
   Having skills to create and comprehend mapped data, graphs, pie charts, and emerging forms of visualizations
   will help students effectively navigate visually rich information sets

3. **Data in Argument**
   Our students can assemble random bits of factual data. However, it takes far more skill to
   Understand how data is used—both informational and persuasively—to support arguments in resources
   students examine, and then for students to create viable arguments themselves. These
   Arguments could take the form of statistics embedded as evidence in a research paper, shared charts and graphs
   with tweaked or non standardized elements, advertising, or info graphics.

4. **Big Data and Citizen Science**
   More and more data is being collected, often without citizens’ knowledge, via frequent shopper Cards, step
   counters, social media, and more. Some data is life-saving, such as DIY systems that help parents monitor their
   children’s Type 1 diabetes by transferring insulin data temporarily and anonymously online .Careful human
   interpretation of big data is required for positive outcomes to be achieved.
   One student-friendly entry point for interacting with big data is citizen science.

5. **Personal Data Management**
   From Google’s personalized search results to Face book’s custom ads, students have daily experience,
   captured as their clicks and likes are converted into actionable data. While students might like seeing relevant
   ads or music recommendations that match their favorites, few know it is because of the breadcrumb trail they
   leave behind. Students may think the website CNN.com is serving up the news to them, but they are usually
   unaware that as many as fourteen bots are following their actions and converting their clicks into data

6. **Ethical Data Use**
   Data is not inherently good or bad, but it can be framed, edited, manipulated, or otherwise
   Modified for unethical purposes

**Data Literacy for Student Achievement**
   Data literacy plays important role in student’s achievements. Since the passage of the No Child Left
   Behind legislation (2001), school districts have used student assessment scores to track and report areas of
   strength

**OBJECTIVE OF THE STUDY.**
   - To test whether there exist any significant difference in the level of students in post graduate level regarding
   the data literacy in the following sub samples
     - Subject of specialisation
     - Locale of the college

**HYPOTHESIS OF THE STUDY.**
   - There will be significant difference in the level of data literacy among post graduate students on the basis
     of
     - Subject of specialization
     - Locale of the college
IV. Methodology.

A survey technique was adopted for the study.

Sample

For the present study 600 post graduate Students of arts and Science College, from Calicut district was selected as sample. The due representation was given to gender, subjects of specialization, locale of the college and type of management of schools.

Tool

*Data literacy test* include test items which prepared in accordance with five component of data literacy. This test consists of series of 50 items. Each questions has four choices as options. The reliability of the tool found with Cronbachs alpha which is a statistical technique used to determining the internal consistency of the items. The value of Cronbachs alpha is .745 To ensure the face validity the investigator consulted experts in the area during the development of the tool and the tool was given to the experts for approval of items for testing data literacy among post graduate students. Thus ensured the face validity.

V. Analysis & Discussion.

The important statistical properties of the scores on the variable data literacy were analyzed as a preliminary step. The mean, median mode, standard deviation, skewness and kurtosis were calculated for total sample are in the table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Standard Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>600</td>
<td>23.76</td>
<td>24.00</td>
<td>25.00</td>
<td>6.31</td>
<td>-.167</td>
<td>-.442</td>
</tr>
</tbody>
</table>

Figure 1. Histogram for preliminary analysis

Discussion of the result

Table shows that the values of mean, median, mode of variable data literacy for total sample are 23.76, 24 and 37 respectively. These values are almost equal which shows the possibility of the variable to follow normal distribution. The obtained value of skewness is -.166 which means the distribution is negatively skewed. The value of kurtosis is -.442 which suggests that the above distribution is leptokurtic. The distribution of the variable data literacy is approximately normal
Major analysis

Extent of data literacy among post graduate student for the relevant sub samples based on locality

Table 2

<table>
<thead>
<tr>
<th>Mean Score</th>
<th>Percentiles</th>
<th>Male Score</th>
<th>Female Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>Urban</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.03</td>
<td>20.59</td>
<td>P_{10} 16</td>
<td>P_{10} 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P_{20} 18</td>
<td>P_{20} 16</td>
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<td>P_{30} 20</td>
<td>P_{30} 18</td>
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<td>P_{40} 23</td>
<td>P_{40} 19</td>
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<td>P_{60} 26</td>
<td>P_{60} 22</td>
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<td>P_{70} 27</td>
<td>P_{70} 24</td>
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<td>P_{80} 29</td>
<td>P_{80} 25</td>
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<tr>
<td></td>
<td></td>
<td>P_{90} 33</td>
<td>P_{90} 27</td>
</tr>
</tbody>
</table>

Figure 2 Graphical representation of data literacy among post graduate student for the relevant sub sample locale of the college

Discussion of The Result

The obtained mean for rural and urban post graduate students in the data literacy test is 24.03 and 20.59. From the table, the 50th percentile of the scores of data literacy test for rural and urban post graduate students is 25 and 20. This mean 50 percent of rural and urban when post graduate students in below the score 25 and 20 respectively similarly, we can interpret other percentiles
Extent of data literacy among post graduate student for the relevant sub samples based on subject of specialization

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Mean and percentile score of data literacy test among post graduate students based on subject</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Score</td>
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<tr>
<td></td>
<td>Science</td>
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<tr>
<td>Science</td>
<td>27.58</td>
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<tr>
<td>Arts</td>
<td>21.67</td>
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<tr>
<td>Commerce</td>
<td>23.76</td>
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<tr>
<td>Language</td>
<td>20.59</td>
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<td>P80</td>
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<td></td>
<td>P90</td>
</tr>
</tbody>
</table>

Figure 3. Graphical representation of data literacy among post graduate student for the relevant sub sample based on subject

Discussion of the result

The analysis procedure estimated Data literacy based on subject of specialization and categorized them in to three categories viz, science, arts, commerce and language. Score greater than neutral value consider as data literate. It is inferred from the table that science students have data literacy than arts, commerce, language students. The table also reveals that 10th percentile of the scores of data literacy test among post graduate students from science ,arts, commerce ,language are 21,14.2,15.10,14 respectively .This mean that only 10
percent of post graduate students from science, arts ,commerce ,language  lie below the score 21,14,2,15 and10,14 respectively and 90 percent lie above that score. Similarly we can interpret other percentiles

VI. Findings

✓ The mean score obtained for the data literacy test is less than neutral value  which means that extent of data literacy among post graduates are not satisfactory to certain extent
✓ Extent of data literacy for urban and rural post graduate students shows that rural college students posses more data literacy than urban colleges
✓ Extent of data literacy among post graduate students based on subject , from science ,arts, commerce and language is 27.58, 21.67, 23.76 , 20.59 .It reveals that science students posses more data literacy than other subjects. language students and arts students have minimum level of data literacy
✓ Based on locale of the college data literacy among post graduate students did not differs significantly (t: 1.419).It implies that there no significant difference between rural and urban post graduate college students in their data literacy score.

VII. Conclusion

Extent of data literacy among post graduate students are not satisfactory to certain extent. Based on locale of the college, post graduate students did not differ in their level of data literacy. Rural college students posses more data literacy than rural post graduate students

VIII. Educational Implication

➢ The result of analysis shows that data literacy among post graduate students is satisfactory to certain extent. Hence importance should be given to include the concept of data literacy in the curriculum for upgrading data literacy capacity of college students
➢ The rural college students possess more data literacy than urban college students. So environment should change, among urban students for improving data literacy level
➢ Include content, problems and situation relating to the data calculation in the curriculum
➢ Conduct quiz programme in a competitive way to make awareness about data analysis method.

References

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