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UTILIZATION BEHAVIOUR OF MATHEMATICS STUDENTS ON OPEN EDUCATIONAL RESOURCES PRACTICED BY BKN HSS, NASIYANUR, ERODE DISTRICT

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ABSTRACT

For any teaching learning process, the study materials like text books, reference books, lecture notes, You Tube videos, PPTs, animations articles, assignments and test materials areessential for the learners and teachers. Some of the study materials are restricted to access, payable but some are freely available in the websites for the public. The study materials which are available openly in online and accessible any number of times are called Open Educational Resources (OERs). Open Educational Resources are openly licensedto be used, revised, updated and shared with others for the learning purpose. The learners are exposed wide range of digital learning materials which are motivates the self-learning and self-assessment when using the Open Educational Resources. Hence, the researchers have decided to analyze the utilization behaviour of open educational resources among mathematics students who are studying in BKN HSS, Nasiyanur, Erode District in Tamilnadu. For this objective, the researchers have chosen 38mathematics students by approaching random sampling method. A self-developed questionnaire has been made and the required opinion of the students regarding study objective have been gathered. The collected sample data are tabulated with the help of MS-Excel software and analyzed by applying the statistical techniques like Percentage analysis, Mean score, Standard deviation and ANOVA test. For the analysis purpose, this study framed null hypotheses to examine the significant difference between the utilization of open educational resources with regard to selected variables by the way of SPSS software. This study observed from analysis that high level utilization of open educational resources is perceived by students who belong to male, family living location as rural, using mobile phone for their study, moderate atmosphere at home, allocate 3 hours for their e-learning and using mobile phone for their study.

Keywords: Open Educational Resources, School Students, Mathematics Subject.

1. INTRODUCTION

Open Educational Resources are the learning materials or resources forthe purpose of teaching learning process which are published in the open platform like websites or openly licensedfor the learners to freely accessed, modified based on the recent facts andexchanged with other similar learners. Open Educational Resources comprises all type of learning material from PPT or a single video or animations to the online course for complete curriculum and which includes the software to produce, modification, and share the learning materials. The teaching learningmaterials and research resources that exist in the public platform or have been published under an intellectual property license that authorizeslearners for free use. OERs consists course materials, fulltutorial, semi modules, schoolbooks, specific subject books, You Tube Videos, assignments , learning software, tests and any other form of techniques or materials which used to gain the knowledge.

In 2002, UNESCO adopted the termOpenEducationResource(OER)for the first time in the forum and discussed the Effect of Open Courseware for Higher Education inDevelopingCountries(Vojtech&Grissett, 2017).Hewlett Foundation defined the OER as “teaching, learning and research materials in anymedium – digital or otherwise – that resides in the

public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with nor limited restrictions" (Hewlett Foundation 2018). As the OERs are open licensed and freelyaccessible, the protagonists of OERs advocates that the use of OER providesconsiderable costsavings for students who pursuing higher education when compare with traditional textbooks (Wiley, Hilton,Ellington, & Hall, 2012). The students who are doing higher education invests more money and time for the learning purpose. So the education becomes costly and rising day by day, then education may be unreasonably restricted to wealthy populations, thus preserving an intergenerational cycle of poverty that leads to underperformance and their lack of attendance. The quality education is low, which affects the labour productivity then leads to low income which continues to poverty and can disturb economic growth (Verner, 2004).Open Educational Resources reducing the cost of educational materials may motives the unaffordable learners for accessing the learners.

2. REVIEW OF LITERATURE

The study of Gabrielle Vojtech and Judy Grissett (2017) revealed that respondents gave positive feedback to the faculty member those who are using an open textbook compare with faculties who followed the traditional text book in terms kindness, motivation, creativity and provided the more flexible learning environment. The author Virginia Clinton (2018) measured that outcome of utilization of Open Educational Resources and concluded that saving the cost of education and reduced the course dropouts and produced the better marks or grades in their exams. Hence, students recorded the positive feedback and better perceptions on usage of OER while usage of traditional learning materials and commercially available course materials. In the other hand, this study also criticised the quality of OER. Monica B. Fine (2020) studied the preference of OERs by the students and concluded that a solid associationamong the online courses preferred by the students and encouragingobservations of Open Educational Resources (OER). Also, the resultof study to the online course, Open educational resources reduce the costs of education, indicates the positive student perception on the online courses.The outcome from John Hilton (2019) determined in this study that the utilization of OER among students simultaneously saved their cost and also maintaining the interest in their learning. Also, the students achieved the good learning outcomes while they learning through OER and the same time, it savesconsiderable cost. Also, the most of learners and teachers who had utilized OER had aencouragingfeedback and experience which leads them to follow the online materials further.

The result from Matthew K. McGowan et al. (2009) found that students overwhelmingly prefer paper textbooks. Also, students commonly agreed that possession an e-textbook for future reference was not abenefit of an e-textbook. At that time, there were vitalvariancesamongthe learners who preferred traditional textbooks and e-texts concerning the formats.According to Nicholas B. Colvard et al. (2018) identified that adoption of OER was not only saved more money in terms of materials and also improved the course grades at the end of the course and reduced the lower grades in all categories of students and motivated towards the higher education. Additionally, Open Educational Resources are inexpensive, accomplishment, achievement gap worries, and learning.

The researchers Grossman and Simon (2020) explored that student having more and strong positive responses to video based OERs, which are reliable for observing the situations like motions, animals interacting with background and the atmosphere, active learning. Ikahihifo et al. (2017) inferred that most of students accepted the OER was good when it compared with traditional textbooks in terms of worth and up to date. Also, more students pointed out that the students have utilised the saved money for their tuition fees, buying study materials, taking value added courses; other expenses and savings for future expenses.

3. STATEMENT OF THE PROBLEM

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In a decade of school education, more competitive among the private as well as government schools in giving better educational methods in Tamilnadu. For this, the schools are trying to encourage the students with using open educational resources for all the subjects. In particularly, most of the CBSE schools and private schools are giving technologically updated teaching methods that give more competition to other private schools and government school located in both urban and rural areas. At this juncture of the discussion, this study emerged to examine the utilization of the open educational resources of the students who are studying in BKN school located in Nasiyanur taluk of Erode district, Tamilnadu.

4. OBJECTIVES OF THE STUDY

- To explore the demographic profile of the selected students of BKN Higher Secondary School, Nasiyanur.
- To analyse the utilization behaviour of open educational resources among mathematics students in the study area.

5. HYPOTHESIS OF THE STUDY

- Male and female are not utilized open educational resources equally, Significant.
- Mean Utilization score of school students is nothaving significant different in open educational resources with regard to family living location.
- Mean Utilization score of school students is not having significant different in open educational resources with regard to type of gadget using.
- Mean Utilization score of school students is not having significant different in open educational resources with regard to time allotted for e-learning.

6. RESEARCH METHODOLOGY

For examining this research objectives, the investigators haveimplemented descriptive research design. A self-developed questionnaire has been administered which consisted the demographic profile of the students and their utilization of open educational resources consists nine statements, and distributed among population. The required primary data are collected through study instrument and also the secondary data are gathered from books, published journals, magazines, online resources, etc. The sample size has incorporated 38 mathematics students of BKN HSS, Nasiyanur. The collected sample data are analyzed through SPSS software by the way of utilizing the statistical methods like Percentage analysis, Mean score, Standard deviation and ANOVA test.

7. RESULTS AND DISCUSSIONS

The section explains about the relationship between demographic profile and utilization of open educational resources of the mathematics students of BKN HSS, Nasiyanur.

7.1 Demographic Profile of the Employees (Percentage analysis)

The following tables explores about the relationship demographic profile including the variables such as gender, family living location, family monthly income, number of siblings, type of gadget using, study atmosphere at home and time allotted for e-learning and their utilization of open educational resources of the students.

Gender and Utilization of Open Educational Resources

Table 1: Gender and Utilization of Open Educational Resources

S.No.	Gender	No. of Respondents	Percentage	Mean Score	SD
1	Male	11	28.9	0.65	0.13
2	Female	27	71.1	0.63	0.10

	Total	**38**	**100.0**		

From the above table, it is inferred that 28.9% of the students are male and 71.1% of the students are female. It is observed that the mean utilization score and standard deviation of the male students as 0.65 and 0.13 respectively. On the other hand, female students got the mean utilization score and standard deviation values as 0.63 and 0.10 respectively.

Family Living Location and Utilization of Open Educational Resources

Table 2: Family Living Location and Utilization of Open Educational Resources

S.No.	Family Living Location	No. of Respondents	Percentage	Mean Score	SD
1	Urban	8	21.1	0.62	0.08
2	Semi-Urban	17	44.7	0.60	0.12
3	Rural	13	34.2	0.68	0.09
	Total	**38**	**100.0**		

It is explored from the analysis that 21.1% of the students' family living location as urban area, 44.7% of the students' family living location as semi-urban and 34.2% of the students' family living location as rural area. It is indicated that the mean utilization score and standard deviation of the students' family living location belong to urban as 0.62 and 0.08 respectively, belong to semi-urban as 0.60 and 0.12 whereas rural as 0.68 and 0.09 respectively.

Family Monthly Income and Utilization of Open Educational Resources

Table 3: Family Monthly Income and Utilization of Open Educational Resources

S.No.	Family Monthly Income	No. of Respondents	Percentage	Mean Score	SD
1	Below Rs.10,000	21	55.3	0.64	0.13
2	Rs.10,000-25,000	17	44.7	0.63	0.08
3	Rs.25,001-50,000	0	0.0	--	--
4	Rs.50,001-1,00,000	0	0.0	--	--
	Total	**38**	**100.0**		

From the analysis, it is assessed that 55.3% of the students' family monthly income as below Rs.10,000 and 44.7% of the students' family monthly income as Rs.10,000-25,000. It is showed that the mean utilization score and standard deviation of the students' family monthly income belong to below Rs.10,000 as 0.64 and 0.13 respectively and belong to Rs.10,000-25,000 as 0.63 and 0.08 respectively.

Number of Siblings and Utilization of Open Educational Resources

Table 4: Number of Siblings and Utilization of Open Educational Resources

S.No.	Number of Siblings	No. of Respondents	Percentage	Mean Score	SD
1	One	15	39.5	0.61	0.13
2	Two	13	34.2	0.64	0.08
3	Above Two	3	7.9	0.59	0.06
4	No Sibling	7	18.4	0.70	0.08
	Total	**38**	**100.0**		

From the analysis, it is assessed that 39.5% of the students have one sibling, 34.2% of the students have two siblings, 7.9% of the students have above two siblings and 18.4% of the students have no sibling. It is examined that the mean utilization score and standard deviation of the students who have one sibling as 0.61 and 0.13 respectively and have two siblings as 0.64 and 0.08 respectively. The mathematic students with above two siblings have utilization mean score and standard deviation as 0.59 and 0.06 respectively and the mean utilization score and standard deviation of the students who have no sibling as 0.70 and 0.08.

Type of Gadget Using and Utilization of Open Educational Resources

Table 5: Type of Gadget Using and Utilization of Open Educational Resources

S.No.	Type of Gadget Using	No. of Respondents	Percentage	Mean Score	SD
1	Laptop	2	5.3	0.56	0.01
2	Tab	0	0.0	--	--
3	Mobile Phone	36	94.7	0.64	0.11
4	Smart TV	0	0	--	--
	Total	**38**	**100.0**		

It is describedfrom the analysis that 5.3% of the students are utilizing laptop for their study purpose and 94.7% of the students are using mobile phone for their study purpose.It is examined that the mean utilization score and standard deviation of the students who using laptopfor study purpose as 0.56 and 0.01 respectively and utilizing mobile phone for study purpose as 0.64 and 0.11 respectively.

Study Atmosphere at Home and Utilization of Open Educational Resources

Table 6: Study Atmosphere at Home and Utilization of Open Educational Resources

S.No.	Study Atmosphere at Home	No. of Respondents	Percentage	Mean Score	SD
1	Good	9	23.7	0.62	0.06
2	Moderate	25	65.8	0.65	0.12
3	Poor	4	10.5	0.58	0.11
	Total	**38**	**100.0**		

It is measured from the analysis that 23.7% of the students have good study atmosphere at home, 65.8% of the students have moderate atmosphere and 10.5% of the students have poor study atmosphere at home. It is derived that the mean utilization score and standard deviation of the mathematic students who have good study atmosphere at home as 0.62 and 0.06 respectively, students belong to moderate as 0.65 and 0.12 respectively and poor study atmosphere at home as 0.58 and 0.11 respectively.

Time allotted for E-Learning and Utilization of Open Educational Resources

Table 7: Time allotted for E-Learning and Utilization of Open Educational Resources

S.No.	Time allotted for E-Learning	No. of Respondents	Percentage	Mean Score	SD
1	1 Hour	5	13.2	0.64	0.12
2	2 Hours	27	71.1	0.63	0.11
3	3 Hours	5	13.2	0.67	0.08
4	More than 3 Hours	1	2.5	0.56	0.01

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	Total	**38**	**100.0**		

It is confirmed from the analysis that 13.2% of the students allot 1 hour for their e-learning, 71.1% of the students allocate 2 hours, 13.2% of the students utilize 3 hours for their e-learning and 2.5% of the students spend more than 3 hours for their e-leaning. It is identified that the mean utilization score and standard deviation of the mathematic students who allot 1 hour for e-learning as 0.64 and 0.12 respectively while students spend 2 hours as 0.63 and 0.11 respectively. The mean utilization score and standard deviation of the students who utilize 3 hours for e-learning as 0.67 and 0.08 respectively whereas students allocate more than 3 hours got mean score and standard deviation as 0.56 and 0.01 respectively.

7.2 Relationship between Demographic Profile and Utilization of Open Educational Resources (ANOVA Test)

This section has examined that the relationship between the demographic profile and utilization of open educational resources of selected mathematics students. In order to analyse the relationship between selected independent variables and utilization of open educational resources, a hypothesis has been developed and tested by using ANOVA.

Relationship betweenGender and Utilization of Open Educational Resources

H_0 : There is no significant difference between the utilization mean score of open educational resources with regard to gender of the students.

Table 8: Relationship betweenGender and Utilization of Open Educational Resources

	Sum of Squares	Df	Mean Square	F	'p' value
Between Groups	0.002	1	0.002	0.192	0.664^{NS}
Within Groups	0.415	36	0.012		
Total	0.417	37			

Note :NS - Not Significant

From the analysis, it is explored that the 'p' value is greater than 0.05 so the null hypothesis is accepted. It is found from the Anovatest that there is no significant difference in utilization mean score of open educational resources with regard to gender of the students.

Relationship between Family Living Location and Utilization of Open Educational Resources

H_0 : There is no significant difference between the utilization mean score of open educational resources with regard to family living location of the students.

Table 9: Relationship betweenFamily Living Location and Utilization of Open Educational Resources

	Sum of Squares	Df	Mean Square	F	'p' value
Between Groups	0.051	2	0.025	2.435	0.102^{NS}
Within Groups	0.366	35	0.010		
Total	0.417	37			

Note :NS - Not Significant

From the analysis, it is cleared that the 'p' value is greater than 0.05 therefore the null hypothesis is accepted. It is examined from the Anova test that there is no significant difference in utilization mean score of open educational resources with regard to family living location of the students.

Relationship between Type of Gadget Using and Utilization of Open Educational Resources

H_0 : There is no significant difference between the utilization mean score of open educational resources with regard to type of gadget using of the students.

Table 10: Relationship betweenType of Gadget Using and Utilization of Open Educational Resources

	Sum of Squares	Df	Mean Square	F	'p' value
Between Groups	0.013	1	0.013	1.172	0.286^{NS}
Within Groups	0.404	36	0.011		
Total	0.417	37			

Note :NS - Not Significant

From the analysis, it is measured that the 'p' value is greater than 0.05 consequently the null hypothesis is accepted. It is observed from the Anova test that there is no significant difference in utilization mean score of open educational resources with regard to type of gadget using of the students.

Relationship between Time allotted for E-Learning and Utilization of Open Educational Resources

H_0 : There is no significant difference between the utilization mean score of open educational resources with regard to time allotted for e-learning of the students.

Table 11: Relationship betweenTime allotted for E-Learning and Utilization of Open Educational Resources

	Sum of Squares	Df	Mean Square	F	'p' value
Between Groups	0.013	3	0.004	0.351	0.789^{NS}
Within Groups	0.405	34	0.012		
Total	0.417	37			

Note :NS - Not Significant

From the analysis, it is proved that the 'p' value is greater than 0.05 hence the null hypothesis is accepted. It is concluded from the Anova test that there is no significant difference in utilization mean score of open educational resources with regard to time allotted for e-learning of the students.

8. FINDINGS

- It is found that most of the mathematic students are female in the study area. Also, high level utilization of open educational resources is perceived by male students.
- From the analysis, it is measured that most of the mathematic students' family living location as semi-urban. Further, high level utilization of open educational resources is perceived by students' family living location as rural.
- It is cleared that most of the mathematic students' family monthly income as below Rs.10,000. Additionally, high level utilization of open educational resources is perceived by students' family monthly income as below Rs.10,000.
- It is cleared that most of the mathematic students have one sibling in the study area. Also, high level utilization of open educational resources is perceived by students no sibling.

- From the analysis, it is observed that most of the mathematic students are using mobile phone for their study purpose. In addition, high level utilization of open educational resources is perceived by students who using mobile phone for their study purpose.
- It is indicated that most of the mathematic students have moderate study atmosphere at home. Further, high level utilization of open educational resources is perceived by students who have moderate atmosphere for their study.
- From the analysis, it is obtained that most of the mathematic students allot 2 hours for e-learning. Hence, high level utilization of open educational resources is perceived by students who allocate 3 hours for their e-learning.
- The Anova test showed that there is no significant difference in utilization mean score of open educational resources with regard to gender of the students.
- From the Anova test, it is found that there is no significant difference in utilization mean score of open educational resources with regard to family living location of the students.
- The Anova test indicated that there is no significant difference in utilization mean score of open educational resources with regard to type of gadget using of the students.
- From the Anova test, it is concluded that there is no significant difference in utilization mean score of open educational resources with regard to time allotted for e-learning of the students.

9. RECOMMENDATIONS

- From the research findings, it could be found that even though female students are high in their proportion of the classroom, the utilization of the open educational resources are high by the male students. It indicated that the greater understanding of the male students' perception on OERs than female students. So, it is recommended to the female students that they have to know more awareness about the OER materials and need utilization that leads to improve the utilization of the OER materials among the female students.
- There is very little understanding of urban living students whereas high understanding in utilizing the OER among the rural students that indicates rural students have very much eager and utilization of OER materials. So, it is recommended to the urban based students that they have to take more attention to utilize the OER materials in an efficient way.
- From the research findings, it is clearly understood that though single sibling students have more proportion, no sibling students are having more knowledge in utilizing OER that indicates may the no sibling students have more interest and get more support from their family. So, it is recommended to the students' parents who have siblings in their family that they may take care about their children's academic activities and spare some time to sitting with them for their utilization of OER that leads to spurts and starts more utilization of the OER.
- Through the research, it obviously rural students' utilization of OER is high with using the gadget of mobile phone, but may be their atmosphere is not in good condition. So, it is recommended to the students' parents who have been utilizing mobile phone for studying mathematics that the parents may arrange a good atmosphere to their children, leads to increase their knowledge and utilization of the OER in an efficient way.
- This research study gives a concrete result about spare more time to utilization of OER, the students have more knowledge and have a good idea in their mathematics subject. At the same time, their parents should watch their utilization of OER materials that also support to avoid the diversion of their utilization of OER materials.

10. CONCLUSION

This study aimed to analyse to the utilization behaviour of Open Educational Resources among mathematics students of BKN HSS, Nasiyanur. A good opportunity is for higher secondary school students to address completion, quality and affordability challenges in their study by

utilizing open educational resources. The result of this study states BKN HSS students are sensitive to differences in the utilization of open educational resources. The open educational resources provide more flexibility and adaptability for students to influence the study materials and restructure their courses due to the instructional design behind the open materials and course layout. This study confirms that open educational resources help higher secondary students to increase the knowledge on their syllabus material and to achieve their educational goals in less time.

11. REFERENCES

- Gabrielle Vojtech, & Judy Grissett, (2017). Student Perceptions of College Faculty Who Use OER. *International Review of Research in Open and Distributed Learning, 18*(4), 155-171.
- Grossman, G.D., & Simon, T.N. (2020). Student Perceptions of Open Educational Resources Video-Based Active Learning in University-Level Biology Classes: A Multi-Class Evaluation. *Journal of College Science Teaching,* 36-44.
- Gupta, S.L. (2007). *Marketing Research.* 1st Edition, New Delhi: Excel Books.
- Hewlett Foundation, (2018). OER Defined. Retrieved from https://hewlett.org/strategy/open-educational-resources/
- https://rmit.libguides.com/openeducationalresources
- Ikahihifo, T.K., Spring, K.J., Rosecrans, J., & Watson, J. (2017). Assessing the Savings from Open Educational Resources on Student Academic Goals. *International Review of Research in Open and Distributed Learning, 18*(7), 125-140.
- John Hilton, III. (2019). Open educational resources, student efficacy, and user perceptions: a synthesis of research published between 2015 and 2018. *Education Tech Research Dev, 68,* 853-876.
- Knox, J. (2013). Five critiques of the open educational resources movement. *Teaching in Higher Education, 18*(8), 821–832.
- Kothari C.R. (2009). *Research Methodology: Methods & Techniques.* 2nd Edition, New Delhi.
- Matthew K. McGowan, Paul R. Stephens, & Charles West, (2009). Student perceptions of electronic textbooks. *Issues in Information Systems, X*(2), 459-465.
- Monica B. Fine, (2020). Factors Impacting Student Perception of Open Educational Resources. *e-Journal of Business Education & Scholarship of Teaching, 14*(1), 151-173.
- Nicholas B. Colvard, C. Edward Watson, &Hyojin Park, (2018). The Impact of Open Educational Resources on Various Student Success Metrics. *International Journal of Teaching and Learning in Higher Education, 30*(2), 262-276.
- Verner, D. (2004). Education and its Poverty-Reducing Effects: The case of Paraiba, Brazil. https://doi.org/10.1596/1813-9450-3321
- Virginia Clinton, (2018). Cost, Outcomes, Use, and Perceptions of Open Educational Resources in Psychology: A Narrative Review of the Literature. *Psychology Learning & Teaching, 18*(1), 4–20.
- Vojtech,G.&.Grisett(2017).StudentPerceptionsofCollegeFacultyWhoUseOER.*The International Review Of Research In Open And DistributedLearning,18*(4), 1-5.
- Wiley, D., Hilton, J., Ellington, S., & Hall, T. (2012). A preliminary examination of the cost savings and learning impacts of using open textbooks in high school science classes. *International Review of Research in Open and Distance Learning, 13*(3), 1-7.
- Wiley, D., Williams, L., DeMarte, D., & Hilton, J. (2016). The tidewater Z-degree and the INTRO model for sustaining OER adoption. *Education Policy Analysis Archives, 24*(41), 1–12.
- Winitzky-Stephens, J. R., & Pickavance, J. (2017). Open educational resources and student course outcomes: A multilevel analysis. *The International Review of Research in Open and Distributed Learning, 18*(4), 12.
- www.edweek.org/teaching-learning