

Content Analysis of OER: A Literature Review

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Abstract

Current paper reports the findings of a content analysis of Open Educational Resources. Twenty three studies were collected for the analysis. The studies were collected from different journals depending on open access policy. Every study was categorised by author, year of publication, title of the study, author characteristics and analysis. The analysis refers to the information about Open Educational Resources variables. Therefore the investigators categorize the research papers based on OER. An analysis of research papers was formed in conclusion and finalizing the common dimensions of content analysis of OER studies.

Keywords: Content Analysis, Open Educational Resources, Literature Reviews

Introduction

Educational sources for academic development are essential however, in many countries there are several problems such as low availability of high-quality education materials, lack of access for poor people and so on. Learning materials are available but the cost of access in many countries are high and increasing every year.

According to the U.S Bureau of Labour Statistics the cost of college text books in the United States was increased 88% between Jan 2006 to July 2016, and according to the report of College Board, students had to spend \$ 1,200 in 2017-2018 and \$1,240-\$1,440 for the academic year 2018-2019. From these statements, it can be concluded that the cost of the text books are very high. As a developing country, India needs to save money. In this study, the researcher suggests the OER to help ease the sting of the high cost of textbooks.

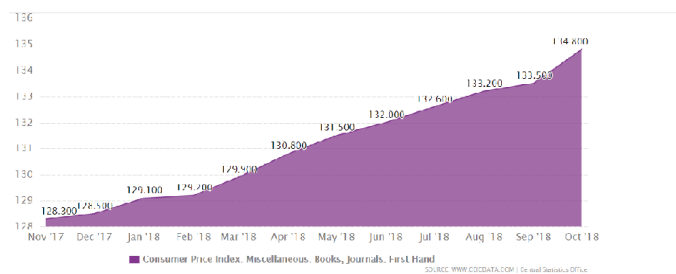


Figure 1: Consumer Price Index of UNESCO Report

According the UNESCO, “teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions.”

According to Wikipedia “Open educational resources (OER) are digital materials that can be re-used for teaching, learning, research and more, made available free through open licenses, which allow uses of the materials that would not be easily permitted under copyright alone.”

The William and Flora Hewlett Foundation define the OER as, “teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge.”

Based on these definitions, the researcher identifies some common points about OER such as,

- Open license, no-cost access and no limited restriction
- Digital Materials and Public Domain
- OER Non-discriminatory that means given the rights to everyone an everywhere for using OER
- Teaching, Learning and Research Resource

OERs in Indian Context

Thomas (2017) reported Open Educational Resources (OER) in India context as: 1) Digital Library of India, 2) National Digital Library (NDL), 3) National Knowledge Network (NKN), 4) Shodhganga 5) Shodh Gangotri, 6) EPrints@IISc, 7) National Programme on Technology Enhanced Learning (NPTEL), 8) Consortium for Educational Communication (CEC), 9) Project Ekalavya, 10) Project OSCAR(Open Source Courseware Animations Repository, 11) National Mission on Education using Information and Communication (NMEICT), 12) National Repository of Open Educational Resources (NROER), 13) Agropedia, 14) eGyanKosh, 15) e-PG Pathshala Project 16) National Council of Educational Research and Training (NCERT), 17) National Institute of Open Schooling (NIOS) and 18) SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds).

Background of the Study

Content analysis is a research method; in the past the method was used mostly in health

studies; in recent years this method has become suitable for social sciences etc. (Hsieh & Shannon, 2005).

Berelson (1952) define content analysis as “a research technique for the objective, systematic, and quantitative description of the manifest content of communication”. Kerlinger (1973) define it as “a method of studying and analyzing communication in a systematic, objective, and quantitative manner for the purpose of meaning variables”. Walizer and Wienir (1978) define it as “any systematic procedure devised to examine the content of recorded information”. Weber (1990) says, “Content analysis is a research method that uses a set of procedures to make valid inferences from text”. Then, it can be concluded that the basic features of content analysis are as follow;

- Content analysis as a research technique was used to communicate the evidence based content on objective, systematic and quantitative description.
- Content analysis as a systematic procedure used to examine the recorded information through the content and valid inference from the text.

Content analysis is data analysis technique usually of texts using a systematic approach that involves sampling, coding and quantification. It is concerned with the classification, organization and comparison of the content of document or communication.

Content analysis method helps the researcher to systematically identify its properties and include large amount of textual information and making valid conclusions from texts. It aims at determining the presence of certain words or concepts with in texts. It is an empirical method for systematic, inter-subjectively transparent description of substantial and formal features of messages.

According to Krippendorff (1980) a content analysis deals with six questions such as,

- Which data are analyzed?
- How are they defined?
- What is the context relative to which data are analyzed?
- What is the population from they are drawn?
- What is the target of the inferences?
- What are the boundaries of the analysis?

Theoretical Framework of OER Studies

A synthesis of the review investigated the relationship between OER sources. In the justification, the sample consists of 23 reviews from different journal articles, the sample of the review based on inclusion criteria such as psychological variable of OER, article type, article range and year limit. The

content analysis is the relationship between the articles based on the sample, psychological variable and methodology. From the above the connection the research categorized the reviews based on author name, title of the study, sample of the study and tools used the study from the below Table 1.

Table 1: Related Literature Review based on OER

S. No	Year	Name	Title	Sample	Methodology	Data Analysis	OER (Tools)	Result	Variables
1	2014	Olufunke and Adegun	Utilization of Open Educational Resources (OER) and Quality Assurance in Universities in Nigeria	569 Undergraduates Students, Multi stage and simple random sampling	Survey Type	Descriptive	Questionnaire on utilization of open educational resources and quality assurance in universities. QOERQAU	The awareness of OER-Moderate. & Level of Usage of OER-Moderate	Utilization of OER and Quality Assurance
2	2018	Anthony, Ebi Bio and Vikoo	OER and Post Graduate students Academic achievement	150 Post Graduate Students	Survey Type	Descriptive and Z Test	PGSOER	Awareness of PG Students OER Level is Very Low	Academic achievement of OER
3	2018	Nyamwembe, Tanui and Wamutitu	Relationship Between Students' Awareness and Utilization of Open educational Resources for Academic work in Private Universities in Kenya	349 B.Ed UG Part Time Students	Survey Type	Descriptive Analysis and regression	Student Questionnaire of Likert Type	Positive Relationship Between Utilization and Awareness. Awareness of OER-Moderate	Awareness of OER and Utilization of OER
4	2018	Nyamwembe, Wamutitu and Tanui	Relationship Between Students' Perception and Utilization of Open educational Resources for Academic work in Private Universities in Kenya	349 Part Time students B.Ed	Survey Type	Regression analysis	Student Questionnaire of Likert Type	There is a Positive relationship between Utilization of OER and Perceptions in the use of OER.	Utilization of OER and Students Perception
5	2013	Hussain, Chandio and Sindher	A Study on Attitude of University Academia towards the use of Open Educational Resources in higher education	278	Mixed method	Quantitative: Descriptive Qualitative: Grouping themes	Questionnaire of Likert Type and interview protocol	Accuracy and authenticity. Open Educational have given new direction to the academia, educational administrators and policy makers to bring innovations in mainstream education systems.	Attitude of University Academia of OER

6	2020	Issa,Ibrahim, Onoja and Onojah	Utilization of Open Educational Resources for Learning in Universities in Kwara State	385 respondents were randomly sampled	Survey Type	Descriptive statistics and Duncan Multiple Range test.	Commonly used Open Educational Resources (OER) where respondents. Utilization of OER	low utilization of OER among students despite their high level of its awareness	Utilization Of OER for Learning.
7	2019	Kumar and Vasimalairaja	A Study on Awareness and Attitude towards Open Educational Resources in Higher Education Students	300 - stratified random sampling	Survey Method	descriptive statistics and Pearson's product moment correlation	OER awareness inventory and Open educational resource's attitude scale	There is significant relationship between awareness and attitudes of higher education students in their open educational resources	Awareness and Attitude towards OER
8	2016	Kurelovic	Advantages and Limitations of Usage of Open Educational Resources in Small Countries.	64 respondents from Google form.	Mail Survey Type	Analysed using descriptive statistics and using non parametric Mann-Whitney U test.	The questionnaire was used 5-level Likert type scale	Attitude towards are not significant, There is no significant difference in availability of teaching materials and academic titles.	Attitudes towards OER and teaching materials in regards to the academic title and scientific fields.
9	2106	Komineas and Tassopoulou	Use of Open Educational Resources (OER) in Aspete: Students' Attitude, Awareness and Benefits OER.	31 Respondents	Survey Method	Percentage Analysis.	Questionnaire which was used contains 14 questions about the OER.	Awareness of OERs: 35% and y the same rate of 32% of the participants in the survey. It has become apparent that the rate is aware of the OER and their functions (35%) is equal to the percentage.	Attitude, Awareness and Benefits OER.
10	2020	Issa, Ibrahim, Onojah and Onojah	Undergraduates' Attitude towards the Utilization of Open Educational Resources for Learning	385 Respondents	Survey Method	Descriptive statistics (frequency counts, percentage and mean) and Rank order.	3 Research Questions and UOERL questionnaire was developed by investigator.	Positive attitude towards use of OER for learning.	Attitude towards the Utilization of OER.
11	2014	Alves, Miranda and Morais	Open Educational Resources: Higher Education students' Knowledge and Use	315 Respondents and convenience sample	Survey Method	Percentage and correlation	The questionnaire is composed of closed-ended questions	Correlation : very low or low between IT knowledge	Knowledge and Use of OER

12	2017	Grewe and Davis	The Impact of Enrollment in an OER Course on Student Learning Outcomes	146	Survey Method	Correlation and multiple linear regression	Questionnaire was developed by investigator	positive moderate correlation between OER versus Non OER and student achievement	Impact OER
13	2107	Hassall and Lewis	Institutional and technological barriers to the use of open educational resources (OERs) in physiology and medical education	209	Survey Method	descriptive statistics	Questionnaire was developed by investigator	extremely comfortable with OERs with technology or better supported by departments but tended to be aware of a greater number of sources of OERs	Use of open educational resources (OERs)
14	2012	Rolfe	Open educational resources: Staff attitude and awareness	Faculty Staff N= 6 and Staff Responds N=50	Mixed Method	Quantitative: Descriptive (Mean , SD) Qualitative: Percentage, Chi-squared test and Mann Whitney U test	5 point likert scale	Awareness: Male higher than Female Attitude: There was no significant difference in the levels of activity between the two groups.	Attitude and Awareness based on OER
15	2015	Jurado and Petterson	Attitudes and Utilization of Open Educational Resources	42 sample (Cuba, Guatemala, Peru, Brazil)	Survey Method	Percentage analysis used	Questionnaire was developed by Researchers	OER More positive Attitude for staff development awareness of OER. Utilization of OER- Lecturers' attitude is of critical importance.	Attitudes and Utilization based on OER
16	2017	Gambo and Aliyu	Use of open educational resources and print educational materials by federal college of education katsina, Nigeria: A Study	358 students were sampled. Simple stratified sampling technique.	Survey Method	Percentage analysis used	Close -ended questionnaire was used as instrument for data collection. and The questionnaire was validated by experts	Positive attitude toward OER.	Use of OER
17	2017	Ozdemir and Bonk	Turkish Teachers' Awareness and Perceptions of Open Educational Resources	99 online survey respondents and 6 six interviewees	Mixed Method	Quantitative: Descriptive (Mean , SD) Qualitative: Percentage	5 point likert scale questionnaire was validated by experts and Questionnaire was developed by investigator	OER awareness revealed a lack of knowledge and highly positive perceptions	Awareness and Perceptions based on OER

18	2014	Hatzipanagos and Gregson	The Role of Open Access and Open Educational Resources: A Distance Learning Perspective	30 Participants	Survey Method	Percentage Analysis	Questionnaire was developed by investigator	Quality and visibility in order to become accepted in higher education.	Role of Open Access and OER. Distance Learning Perspective.
19	2018	Pande	Opportunities and challenges in the adoption of open educational resources for course development: a case study of Uttarakhand Open University	Course content, Time frame of various Activity and Money save using OER.	Case Study Method	Basic Mathematical Operations (mean and percentage)	investigator	Adoption of OER practices in the development of SLM has a positive impact on the quality of the study material.	OER for course development
20	2019	Pande	Open educational practices at Uttarakhand Open University: from policies to implementation	26 Faculty Members	Survey method	Mean Average and SD	investigator	Positive attitude	Attitude of Faculty Members
21	2016	Delimont, Turtle, Bennett, Adhikari and Lindshield	University students and Faculty have positive perceptions of open/ alternative resources and their utilization in a textbook replacement initiative	524 student 13 Faculty members	Survey method	Descriptive statistics and percentages	Investigator developed and 7 - Point Likert scale questions and 11 open-ended questions	Support the funding of this initiative and similar initiatives at other institutions.	positive perceptions of OER
22	2008	Venkaiah	Open Educational Resources in India- A Study of Attitudes and Perceptions of Distance Teachers	110, Selected distance teachers University: 6 200: questionnaire	Survey method	Percentage Analysis	5 point scale Developed by investigator	OER's by the distance teachers remarkably high. OER's in India is still low when compared to the developed countries.	Attitudes and Perceptions of OER
23	2105	Rowell	Student Perceptions: Teaching and Learning with Open Educational Resources	80	Survey Method	Correlation	Investigator 5-point Likert-type scale	Significant relation between the six OER Perception dimension means $r = - 0.25$ (Negative – Week)	Student Perceptions: Teaching and Learning of OER

Inclusion and Exclusion Criteria for Sample Selection

From the below table explains inclusion and exclusion criteria of article selections. Open Sources of journal, in the online platform.

Table 2: Inclusion and Exclusion Criteria for Collecting Data

Criteria	Details
Year Limit	2007-2020
Search engines	Google Search
Mode of Search	Only Online Based
Key words for search	Psychological Variable of OER
Articles Type	Open access from the (CUTN server) journal
Articles Range	Related Keywords
Selection Sample	Totally 158 articles after inclusion and exclusion criteria selected 23 articles

The above criteria data were collected from the internet, in the form of electronic documents. The sources of articles based on textual data and that data ensured that the content was not subjectively biased. The total amount of articles is one hundred and fifty-eight, from these articles twenty-three articles was selected from the open sources in online. Finally, twenty-three articles were selected for data analysis.

After the collection of data, the articles were coded based on the themes. For the reason to maintain the reliability, the author of the article has coded the data separately after that the data was read line by line.

According to Rourke, Anderson, Garrison, & Archer (2000) latent content are classified into two categories such as latent pattern content and latent projective content. The coders decoding the content is called latent pattern. The presence of content variable of interest was possibility of the hint. Latent projective content depending on the individual perception of the particular coders, the specific content is decoded by the personality and cognitive abilities of the respective coders (Rourke et al., 2000).

In this study the researcher adopted latent pattern method to analyse the dimensions related to Open

Educational Resources. The researcher categorise the entire contents with the help of some codes or sub-themes by latent pattern content.

Categories

In this study the categories included are sample characteristic, topics, year of publications, about the variable, methodology, data collection method, data analysis method and author characteristics.

Sample Characteristics

Samples were categorized based on the participants such as the coded based on the one category such as, higher Education Students from various Educational Institution

The higher educational students included more than parts, such as college students as UG, PG and University students, professional educational students are B.Ed and medical education, faculty members in educational institution and distance mode of students.

Variable

Variable of the study were coded as based on the topic of the study. In this study, the most frequently used variable is Psychology. The author identifies one fifty-eight articles from the open educational journal, applying the inclusion and exclusion criteria. In this way, the author chose only twenty-three articles for analysis, from this articles variables are related to Open Educational Resources and related psychological perspectives of students in OER such as attitude, perception, awareness, utilization of OER and so on.

Methodology

Articles were coded as quantitative, qualitative and mixed method. Quantitative studies were also coded as descriptive, correlation, experimental, quasi-experimental and non-experimental. Creswell (2012) defined qualitative research as research tradition and research paradigm. Research Traditions included phenomenology, grounded theory, case study and ethnography. Research paradigm included as positivism, constructivism and post-positivism. Mixed method study is depended on method of data collection such as quantitative or qualitative. In this study, for quantitative survey, case study for qualitative and mixed method also used for OER.

Data Collection Method

Data collection method is based on more than one method, those methods are coded as questionnaire, interview, checklist, observation, documents and records.

Data Analysis Method

Data analyse are coded as t - test, F- test, ANOVA, MANOVA, MANCOVA, Factor analysis, correlation, regression and non-parametric statistical approaches such as chi-square, Mann Whitney U test, Willcoxon Rank Sum, Kruskal Wallis, Median Test.

Results

Figure 2 illustrated the comparison between number of articles for selection of analysis and total articles from the open access. Research articles as totally one fifty-eight articles (100%), after the inclusion and exclusion criteria the researcher as identified twenty-three (14.56) articles from the open access.

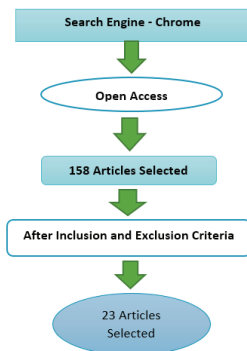


Figure 2: Total Number of Research Articles Compared to the Selection for Analysis of the Research Articles

Sample Characteristics

Participants Most Often Sampled in Research Articles Published in this research.

Table 3: Categorised the articles by Sample

Participants	Open access articles categorised Number of sample
College Students	16 (69.57 %)
Professional Education Learner	3 (13.04%)

Faculty	2 (8.70 %)
Distance Learners	2 (8.70%)
Total	23 (100%)

Research participant’s characteristics are displayed in the table above. Samples composed of OER exceeded the combined number of studies that had been done by teachers or students. College students, professional education learner, faculties and distance learners are the sample of the OER research articles.

Variable

Variable of the study was mainly focused on Psychology. In this study the researcher identified an OER and Psychological Variable. The researcher found the five main factors was related to the OER such as utilization, awareness, academic achievement, perception and attitude of OER for students and faculty members. Table 4 explains the number of variable occurred in the research articles.

Table 4: List of the variable name and Percentage of variables occurred in articles

Name of the Variable	Number of the variable and %
Utilization	10=29.41%
Academic Achievement	7=20.58%
Awareness	4=11.76%
Perception	5=14.70%
Total	34 (100%)

Methodology

In this study, a research method and design are noted in Table 5. Qualitative studies accounted for 4.35% (n=1) and rest of the study were highly in Quantitative 82.61% and remaining was mixed method study 13.04% (n=3). Of the 1 Qualitative study was based on case study method. Descriptive (survey technique) (n=19) are the most frequently published of the quantitative traditions. Mixed method design (n=3) are accounting 13.04%, in this study the method of data collection is both qualitative and quantitative.

Table 5: Research Design of Articles Published

Method	2020 (open access articles)
Quantitative (82.61%)	Descriptive (19)

Qualitative (4.35%)	Case Study (1)
Mixed Method (13.04%)	Qualitative & quantitative (3)

Data Analysis

Data analysis was split by two parts such as quantitative analysis (Table 5) and qualitative analysis (Table 5). From the Table 6, descriptive statistics (38.8%) is used to analyse the data. Rest of the statistical procedure was noted in the order of number of items such as, percentage analysis (27.77), correlation (11.11%), regression analysis (8.33%), Mann Whitney U test (5.55) and Chi-square (2.77%), Duncan test (2.77%) and Z-test (2.77%) which have been used at the same time,

Table 6: Statistical Procedure used in Analysis

Statistical Procedures	Number of Items
Regression Analysis	3 (8.33%)
Z - Test	1 (2.77%)
Chi-square	1 (2.77%)
Correlation	4 (11.11%)
Descriptive statistic	14 (38.88%)
Duncan test	1 (2.77%)
Percentage Analysis	10 (27.77%)
Mann – Whitney U test	2 (5.55%)
Total	36=100%

Data Collection Method

Data collection method was mainly based on, only one method: Questionnaire. The Questionnaires are divided into different types such as: Likert type, Open Ended, Closed Ended, and Inventory and Attitude Scale, remaining study was interview method. Table 7 explain the number and percentage level of method in data collection.

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Table 7: Data collection Methods

Types of Questionnaire	Number of items
Questionnaire	20 (66.66%)
Likert Type	5(16.66%)

Open - ended	1 (3.33%)
Close - ended	1 (3.33%)
Interview	1 (3.33%)
Inventory	1 (3.33%)
Attitude Scale	1 (3.33%)
Total	30=100%

Conclusion / Future Discussion

- The present study reports the findings of a content analysis and there are a number of recommendations which worth considering.
- In addition limitation of this research should be considered.
 - In this article, we collected that reviews have been grouped in to 2007 – 2020 and
 - This articles only based on online free sources.
 - However, this approach also limits interpretations of findings as results could vary based on different sources such as offline, dissertation, workshop, seminars, and newspapers articles and so on.
 - In addition, the research article characteristics such as, other variables in OER, different samples such as other than students, tools of the study, was not accessed as the part of the study.

These are important fields and it must be included in future studies for further research progression.

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