

**Correlational Study of Attitudes, Perceptions and Digital Efficacy of Teacher Educators
towards Open Educational Resources**

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Abstract

Open Educational Resources (OER) have been sought by learners all over the world in the field of education. It has its own intrinsic value due to it being part of open movement and its contribution to the development of education globally. The vast repertoire of resources remains untapped by the teacher education community in University of Mumbai. The present paper intends to study the correlation of the variables that are related to the use of OER and its related aspects. The cognitive, behavioral and affective aspects of the attitudes towards use (AT), perceptions in terms of perceived usefulness of (PU), perceives ease of use of (PEU) and actual use (AU) of open educational resources (OER) have been studied in the present study. The study is a mixed method study and the phase 1 is the qualitative phase which inspires the phase 2, the quantitative phase. The design of the study is thus a sequential exploratory design.

The study is based on the modified TAM model given by Davis and Venkatesh (1996). The Technology Acceptance Model (TAM) has been widely used to predict user acceptance and use based on perceived ease of use and usefulness. The present paper is based on the study of the correlation co-efficient of the variables and attempts to develop a model from the relationships.

Introduction

Open Educational Resources (OERs) have become significantly important in education systems across the world. They represent the efforts of a worldwide community, empowered by the internet, to help equalize the access to knowledge and educational opportunities. These are teaching, learning and research resources that reside in public domain that permits their free use or customization by others. The power of open has supported the knowledge boom and continues to be seamless and ever increasing. The OER movement is only a decade old and has received scant attention in the popular commercial press and media.

The professional course of teacher education requires great support in terms of content and use of technology to make it a quality and useful course. It is the backbone of the entire education system of school as well as college education. Higher education which includes professional education or graduate university education too cannot do well unless we have good teachers. The educational resources, corresponding pedagogy of teaching and use of technology in teaching learning is a major aspect which needs to be researched into and explore the contributions of OER in these contexts. The teachers educators who teach in teacher education programme, has the main concerns that the active time is used for the delivery of the content rather than making use of constructivist pedagogy i.e.(to ensure learning of the content and comprehend it). The teaching strategy is more delivery centric than reflection based or encourages critical thinking that arises out of the content.

Wiley (2010) assumes common understanding of the term educational resources, and argues that open is a matter of (1) cost and (2) copyright licensing and related permissions. For Wiley, open means that a resource is available free of cost and that four permissions (called the “4Rs”) are also made available free of cost. These permissions include:

- Reuse: the right to reuse the content in its unaltered/verbatim form (e.g., make a backup copy of the content)
- Revise: the right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into an- other language)
- Remix: the right to combine the original or revised content with other content to create something new (e.g., incorporate the content into a mashup)
- Redistribute: the right to share copies of the original content, the revisions, or the remixes with others (e.g., give a copy of the content to a friend)

Open Educational Resources are defined as “technology-enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes.” They are typically made freely available over the Web or the Internet. Their principal use is by teachers and educational institutions support course development, but they can also be used directly by students. Open Educational Resources include learning objects such as lecture material, references and readings, simulations, experiments and demonstrations, as well as syllabi, curricula and teachers' guides. The OER phrase broadens dramatically when the word resource, which in this study not only refers to content but a wide variety of tools to support access to the content as well as even more tools that support inquiry.

Use of OER

Several organizations (Connexions, DiscoverEd, MERLOT, etc.) work to aggregate these resources for improved discovery and re-use and past researches have emphasized the organization of this information. With the ever widening access, attention now turns to how these materials are adopted or used. OER use can fall broadly into two categories: **formal and informal learning**.

Users of OER: The key difference between resources and Open educational resources is that in addition to asserting the right to be recognized as the originator of the work that has been shared, the author/owner adds licensing information that lets others know how and under what conditions they might use the resource, including whether or not it can be adapted or remixed. Several open licensing frameworks are available but among the most robust and widely used in the education sectors are the Creative Commons (www.creativecommons.org). This framework provides for licensing of resources across a spectrum of more or less restrictive conditions. In education, a Creative Commons License, for example, allows a teacher to remix resources from several sources and adapt them, for example by including more contextually relevant scenarios or activities and/or translating the content into another language, to suit the particular needs of particular groups of learners which include the teachers and teacher educators (TE). The only requirement the teacher has to acknowledge his/her sources.

Methodological Rationale:

In order to study the attitudes towards, perception of usability and usefulness of OER among teacher educators (TE) and the Actual use of OER, the technology acceptance model was adopted to provide a framework for analysis. The study examined correlation between variables because the TAM is a model that helps to establish relations between the variables. The model used in this study focuses on examining direct relationship between an exogenous variable Digital Efficacy (DE) and four endogenous variables (attitudes towards OER, perceived ease of use, perceived usefulness, and actual system use of OER). In correlational analysis, direct relationship between variables has been tested; no intermediate variables have been observed through one or more additional variables. Exogenous variable DE is influenced by other variables in the model, so application of Digital-Efficacy is affected variable with several observed influences. The endogenous variables too, have effects between them that are observed in the analysis. The correlation co-efficient establishes the existence of relationship while multiple regression analysis allows for the relative weights of the variable in predicting the value of the dependent variable.

The strength of the effects was measured with the standardized regression coefficient (β). This β weight allowed for an interpretation of the strength of the effects between the variables. While the interpretation does not imply causality, it does have the power to predict relationships.

The TAM model has been proposed for the study as given by Davis & Venkatesh (1989) and is called the OER Acceptance Model (OERAM).

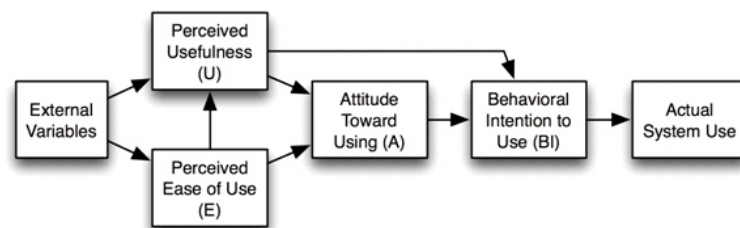


Figure 1: TAM Model given by Davis and Venkatesh (1989)

The **technology acceptance model (TAM)** is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably:

- **Perceived usefulness (PU)** – This was defined by Fred Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance".

- **Perceived ease-of-use (PEOU)** – Davis defined this as "the degree to which a person believes that using a particular system would be free from effort" (Davis 1989).

The model suggests the researcher to contextualize in the study the use of OER being effected by the Digital Efficacy(DE) , Perceived usefulness (PU), Perceived Ease of Use (PEU) , Attitude towards using (AT) and Actual Use (AU).

Methodology : Mixed method research in the present study is primarily based on Creswell's Sequential Explanatory Design. In this design, a researcher first collects and analyzes the quantitative (numeric) data. The present paper discusses the second, qualitative, phase which builds on the first. The two phases are connected in the intermediate stage in the

study. The rationale for this approach is that the quantitative data and their subsequent analysis provide a general understanding of the research problem. The qualitative data and their analysis refine and explain those statistical results by exploring participants' views in more depth (Rossman & Wilson, 1985; Tashakkori & Teddlie, 1998; Creswell, 2003).

Phase II: Quantitative Study

This quantitative study consists of survey conducted on 102 teacher educators where in the tools were designed from the inputs of the qualitative study. The scale to measure the attitude and perceived usefulness and perceived ease of use was designed using a Likert scale on five point dispersion. The quantitative tool was a continuous one with four parts namely attitude (AT), perceived usefulness (PU), perceived ease of use(PEU) and digital efficacy (DE) towards OER. The quantitative study was intended to refine and extend the qualitative findings by testing out a survey developed using qualitative findings. The responses to the tool was collected online via Google forms and from the teacher educators (TE) who were teaching in colleges of teacher education affiliated to University of Mumbai

Tool for measuring Attitude, Perceptions, Percieved usefulness , perceived ease of use and Digital efficacy (APDETOER) Likert Scale towards OERs was prepared by Researcher. It was a multivariate single tool with three sections.

Description of the tool for Quantitative Phase of the study

This study used Content Validity Ratio (CVR) proposed by Lawshe (1975) to identify valid statements. This was accomplished by experts were selected to express opinion on suitability of the identified 65 statements to measure attitude (AT), perceptions , perceived usefulness (PU) and perceived ease of use(PEU) and digital efficacy (DE) towards OER.

The experts were asked to rate the statements in a three point scale (1= Not necessary, 2= Useful, but not essential, and 3= Essential). The researcher used a survey tool to collect data, and experts were also given a brief about context of the research. The statements from 1 to 13 were to measure AT, 14 to 26 were related to general perception and PU, 27 to 31 were to measure PEU, 28 to 41 related to DE and intention and behavior of use of OER. In reality there were 65 statements to be analyzed because some of the statements had a stem and there were sub-statements. This tool was named as APDETOER.

The 65-item scale was subjected to reliability test using two methods that showed Cronbach's alpha at 0.965 and Split-Half (odd-even) Correlation was 0.969, which provided confidence that the items in the scale are interrelated and are measuring the same attributes, i.e. Attitude, Perceptions and Digital Efficacy towards OER. The researcher was interested in analyzing the different aspects of the APDETOER of the scale: Awareness, Sharing and Adaptation. As for the adequacy of the sample, being purposive sample the teacher educators who volunteered were chosen, where N=102.

The details of the tool are given below in the table 1

Cronbach's Alpha	0.965
Split-Half (odd-even) Correlation	0.969
Spearman-Brown Prophecy	0.984
KR21	1.680
KR20	1.695
Questions - 65 , Subjects =102	

Table 1: Details of the Research Tool

The excel sheet used for the above calculation was taken from Reliability Calculator, created by Del Siegle (del.siegle@uconn.edu) for EPSY 5601.

Data Analysis:

Descriptive Statistics for each variable of the quantitative study is given below

N=102	AT	PU	PEU	DE	AU
Mean	56.618	91.392	18.049	41.539	36.255
Standard Error	0.728	1.262	0.286	0.753	0.820
Median	57.000	91.500	18.000	42.000	38.000
Mode	56.000	92.000	18.000	42.000	38.000
Standard Deviation	7.349	12.745	2.889	7.608	8.278

In the present study the correlation table is as follows

	AT	PU	PEU	DE	AU
AT	1				
PU	0.844	1			
PEU	0.510	0.421	1		
DE	0.584	0.598	0.419	1	
AU	0.500	0.501	0.343	0.692	1

And the corresponding graph given below indicates the following relationships between the variables. This relationship is seen in context to the OERAM based on TAM model.

The correlation matrix of the variables where $r=1$ for AU, we see the correlation of AT with PU is 0.84 and AT with AU is the least and $r=0.5$

The correlation of AT with DE, $r=0.584$ is comparatively weaker than AT with PU. There is very weak correlation of PU with PEU though both are related to perceptions of Usefulness and Ease of Use, the $r=0.421$.

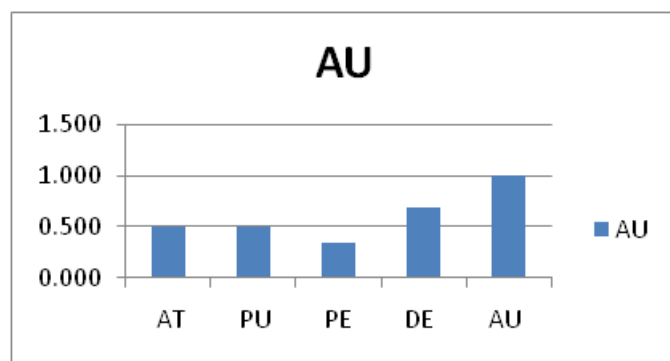


Figure 1: Correlation Co-Efficient of the variables.

In this study the relation between the variables can be graphically shown at a glance as indicated below

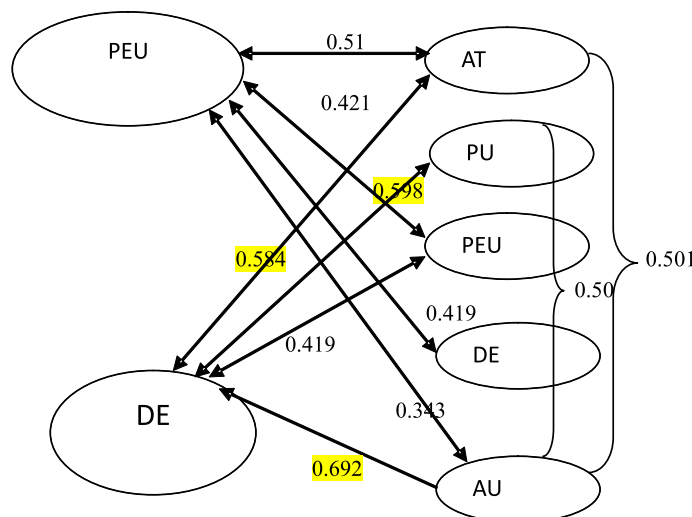


Figure 2: Relationship of Variables with their “r”

From the above diagram the researcher observed the positive and moderately high correlation between DE and PU and AT, and a moderately high correlation with AU. Thus we can represent the dominant variables in correlation with each other.

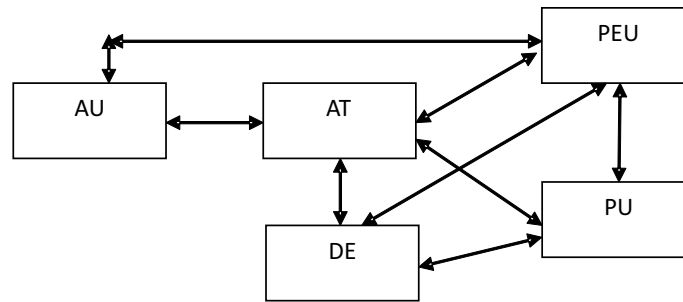


Figure 5: Model Incorporating Significant Correlation Co-Efficient of Variables

The correlation statistics help us to understand the relationship of the said variables that would determine the actual use of OER for Teacher Education program. The various dimensions of Digital Efficacy (DE) and its relation to Actual Use of OER (AU) are important as can be seen from the maximum value of “r” between AU and DE.

The contexts in which we say the digital efficacy exists is as follows-

- Ability of examining specific task performance and narrow behavioral domains rather than overall attainments in relation to general digital technology and use of computers in the area of education.
- Digital technology as OER in education refers to multimedia content for use, adapting, reusing, sharing, and creating materials for formal /informal education. The digital technology as OER will include softwares for learning, or tools or programming using the computers and the internet technology. It will also include the freely accessible materials for teacher development and teacher education under the Creative Commons licenses and other license for sharing or fair use in education
- Ability to share/ adopt/mix different types of OER data and share back with knowledge of compatibility by users.
- Digital-efficacy is built upon the idea that self-beliefs affect motivation and cognition (Bandura, 1989). Hence digital efficacy using digital technology examines skills in computer technology toward the ability to do a given task (in this instance, to find and integrate an OER).

- It is closely related to locating PER, seek information on quality OER, adopt OER, share OER for pedagogy in teaching and provide student autonomy in learning.
- It includes knowledge of platforms, softwares for constructivist learning and compiling own text books(Flex books) or avail open text books with special reference to development education.

Thus the present study focused on the correlation of the variables that facilitate the use of OER in Teacher Education program so that the student teacher are empowered for life and can continue the OER movement in their schools or educational set ups and contribute to the benefit of students at large.

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