Open Praxis, vol. 10 issue 1, January–March 2018, pp. 55–65 (ISSN 2304-070X)

OPEN PRAXIS
INTERNATIONAL COUNCIL FOR OPEN AND DISTANCE EDUCATION

Acceptance and Usability of OER in Indian Higher Education: An Investigation Using UTAUT Model

Nayantara Padhi
Indira Gandhi National Open University (India)
nayantara@ignou.ac.in

Abstract

In the global movement towards open knowledge society, open educational resources (OER) have become a prominent contributor as a medium of education, research and training. In India, the phenomenon of OER is still in nascent stage. Although the country has been massively investing on growth and usage of ICT, it still requires acceptance of OER as a medium of education, research or training. Particularly, adoption and usage of OER posses several challenges such as accessibility, reliability, copy right etc. There is plethora of research studies on the ICT usage in education in India, but there is hardly any empirical research evidence on OER in India. With this backdrop, at the first instance it is very much essential to investigate the acceptance and usability of OER in India. This paper focuses on faculty perception by applying Unified Theory of Acceptance and Use of Technology (UTAUT) model. Apart from this, the study also identifies the challenges associated with OER. For the purpose of this survey data is collected from 22 Indian universities located pan India. The outcome of this empirical research shall certainly useful and provide guidelines for the policy makers and users of OER in India.

Keywords: OER; Usability; Technology Acceptance; UTAUT; India

Introduction

World-wide, open educational resources (OER) have come up as a very useful medium in the fields of education, research and training. The concept of the OER came into existence in 2002 during a conference hosted by UNESCO. After which OER has travelled across the globe in different formats such as OER, Open Courseware (OCW), open textbooks, digital library, open access journal etc. With the basic motto to provide open access to knowledge, one thing that strikes about OER is that there is a lot of activity surrounding this concept. OER is considered as democratization of knowledge and education. It believes in the concept of sharing and participation.

The existing literature on the trends and usage of OER shows that OER is in the infancy stage in Indian higher education and is not utilized completely. Although there are many potential benefits of OER, at the same time challenges are also more in number. It is seen that the acceptance and usefulness of OER still posses a question. In this entire movement the faculty, educators, researchers and trainers play a pivotal role in establishing this concept. In order to get a comprehensive status about the acceptance and usability of OER in Indian higher education, this study aims to investigate about the acceptance and usability of OER in India. The study focuses on knowing the faculty perception about OER in India by using the well-accepted UTAUT model. This study aims to bridge the research gap of identifying the status of acceptance and usability of OER in India.

Status of OER in India

In the year 2008 India formally recognized the concept of usage of OER in education. Resulting which, National Knowledge Commission (NKC) went for a 'national e-content curriculum initiative'. The aim was to create, adapt and utilize OER by Indian institutions. Past which the National Repository of OER (NROER) was launched in 2013. Some of the major OER initiatives in India are presented in Table 1.

Reception date: 13 April 2017 • Acceptance date: 6 December 2017
DOI: https://doi.org/10.5944/openpraxis.10.1.623

These are some of the major breakthrough initiatives in India in the form of digital repositories, open courseware, open access journals, etc. Researchers like Bansal, Chabra and Joshi (2013); Das (2011); Sharma, Mishra and Thakur (2014), Sharma (2013) and Venkaiah (undated) have provided insights into the status, trend and challenges of OER in India. Barring these limited number of research studies which are focused on the status of OER in India, there is hardly any study conducted by any researcher to investigate acceptance and usability of OER in Indian higher education by the stakeholders (teachers, researchers, trainers, students, employers).

Table 1: OER initiatives in India

OER initiatives	Website
CSIR explorations- Open Access Repository of Indian theses	http://eprints.csirexplorations.com/
Digital library of India-digital collection of freely accessible rare books collected from different libraries of India	http://www.dli.ernet.in/
Indian National, Digital library in Engineering, sciences, and technology (INDEST)-Consortium for e resources of engineering and technological institutions	http://paniit.iitd.ac.in/indest/
Kalasampada- Digital library: Resources of Indian cultural heritage	http://ignca.nic.in/dgt_0001.htm
Vidyanidhi- Indian digital library of electronic theses	http://eprints.uni-mysore.ac.in
Vigyan Prasar Digital Library- Digital library contains digital version of significant scientific works	http://www.vigyanprasar.gov.in/digilib/
CEC Learning Object repository- The econtent and unique learning object repositories of providing higher education	http://cec.nic.in/e-content/Pages/default.aspx
E gyankosh- National depository of digital learning resources	http://egyankosh.ac.in/
National Programme on technology enhanced learning (NPTEL)- E learning platform for various courses	https://onlinecourses.nptel.ac.in/explorer
Eklavya- E learning portal	http://ekalavya.org/elearn/EkalavyaUser/Index.aspx
E-Grid- An online learning network	http://econtent.nielit.gov.in/rs/start.php
Brrihaspati- Open platform for learning	http://digitallearning.eletsonline.com/2008/04/brihaspati-e-learning-platform/
ShodhGanga- Repository of PhD theses	http://shodhganga.inflibnet.ac.in/

Rationale

To bridge the research gaps that represent and in order to investigate the intention and perception of Indian university teachers about the acceptance and usability of OER in India, UTAUT model is used in this study. The UTAUT model (Figure 1) was formulated by Venkatesh, Morris, Davis and Davis (2003), by compiling eight acceptance models.

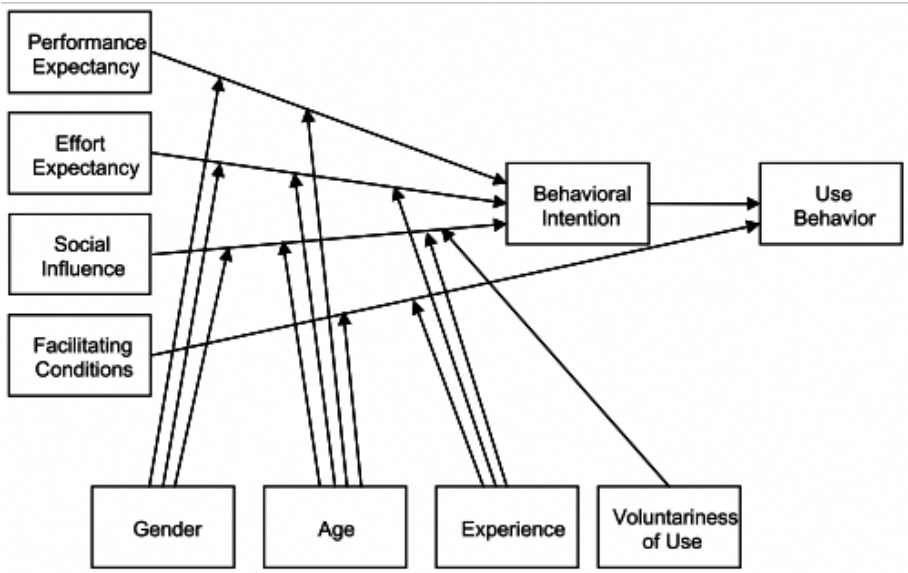

Figure 1: The UTAUT model
Source: Venkatesh et al. (2003)

The UTAUT model (Figure 1) aims to explain user's behaviour intention to use on information system. It holds four key constructs: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. UTAUT is an advanced individual acceptance research by unifying the theoretical perspectives common in the literature and incorporating four moderators to amount for dynamic influences including gender, age voluntariness and experience (Venkatesh et al., 2003).

Methodology

In the present study, UTAUT model is applied to investigate the acceptance and usability of OER in India. In this moderating effect of gender, age, experience and voluntariness of use have been removed because all the sample participants belong to one particular type of higher education institution and their profession is teaching. With these alternations the research model is as presented in Figure 2.

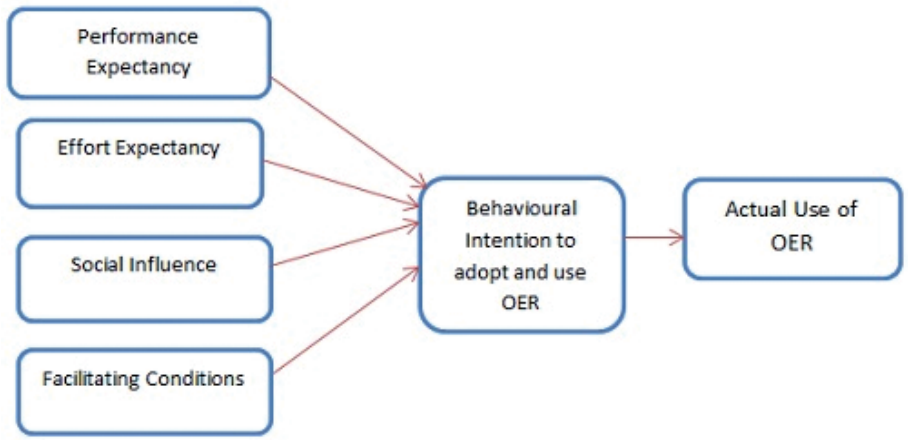

Figure 2: Research model for acceptance and usability of OER in India
Adapted from: Mtebe and Raisamo (2014)

The four constructs of UTAUT model are presented in Table 2.

Table 2: UTAUT Constructs

Core constructs	Definition
Performance Expectancy	The degree to which an individual believes that using the system will help him or attain gains in job performance.
Effort Expectancy	The degree of ease associated with the use of the system.
Social Influence	The degree to which an individual perceives that important other believe he or she should use the new system.
Facilitating Conditions	The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.

Source: Venkatesh et al. (2003) and Tan (2013)

Hypotheses

The four constructs of UTAUT model and its impact on the Behavioural Intention (BI) of teachers to use OER have been well fitted in the research model. The relevance of these four constructs and hypotheses are presented in Table 3.

Table 3: UTAUT Constructs and Hypotheses

Core Constructs	Hypotheses
Performance Expectancy (PE)	H1: PE has a positive impact on BI to use OER
Effort Expectancy (EE)	H2: EE has a positive impact on BI to use OER
Social Influence (SI)	H3: SI has a positive impact on BI to use OER
Facilitating Conditions (FC)	H4: FC has a positive impact on BI to use OER

In this study each of the UTAUT constructs has four items, which are analysed (Table 4).

Table 4: The UTAUT Constructs and Items

Construct	Item Code	Item
Performance Expectancy (PE)	PE1	OER is useful in courses
	PE2	Using OER will enable to accomplices course development activities quickly
	PE3	Using OER would increase learning outcome of students
	PE4	OER use will allow to have access to more information
Effort Expectancy (EE)	EE1	Interaction with OER is clear
	EE2	Easy for using and integrating OER in courses
	EE3	OER is easy to use
	EE4	Learning to use OER is easy

Construct	Item Code	Item
Social Influence (SI)	SI1	People who influence my behaviour think that I should use OER
	SI2	People who are important think that I should use and integrate OER into my courses
	SI3	University staff are supportive in integrating OER in my course
	SI4	University will support the use of OER in teaching and learning
Facilitating Condition (FC)	FC1	I have the resources necessary to access OER
	FC2	I have the knowledge necessary to use and integrate OER in my course
	FC3	OER is similar to other course content I use for teaching
	FC4	Help will be available when I get problem in using and integrating OER in my course

Instrument

The present investigation adopted the questionnaire developed by Mtebe and Raisamo (2014) to study the challenges and instructors intention to use OER in higher education in Tanzania. This questionnaire was a modified version of the questionnaire developed by Venkatesh et al. (2003). The questionnaire is a five-point Likert scale ranging from 1=strongly disagree to 5=strongly agree.

Data was collected using Google platform. The questionnaire was sent to 800 teachers of 22 universities (details about type of university provided in Table 5, A) of India. These universities are located pan India. A total of 36 were undelivered. However, 202 responses were obtained. This comes out to be 26.43% of all respondents. The respondents are teachers of different cadres such as Assistant Professor to Professor (in different disciplines). The study was carried out during April-May, 2015.

Tools

The following statistical tools were used for analysis of collected data.

- Descriptive analysis: It is used to measure frequency of data.
- Reliability analysis: It is a measure to define the degree to which measurements are free from error and therefore yield consistent results. To measure the reliability of instruments and constructs. *Chronbach's alpha* (α) was used.
- Correlation analysis: It is a measure of the degree to which a change in the independent variable will result in a change in the dependent variable. *Pearson correlation* analysis is used in this study.
- Regression analysis: It is a technique for modeling and analysing different variable with a focus on the relationship between a dependent variable and one or more independent variables. The *multivariate linear regression* is used for analysis.

Analysis

The study used the Statistical Packages for Social Science (SPSS) version 20 to analyse the collected data.

Descriptive analysis

All the 202 respondents are teachers of 22 universities of India. Amongst these universities six were ODL universities, 12 were face to face and 4 were dual mode. Table 5 represents the demographic profile (A) as well as response to the basic questions on OER (B).

Table 5: Descriptive analysis

A. **Type of University**

a. ODL – 6

1. IGNOU, New Delhi, India
2. BRAOU, Hyderabad, India
3. VMOU, Kota, India
4. YCMOU, Nashik, India
5. NSOU, Kolkotta, India
6. TNOU, Chennai, India

b. Face to Face – 12

1. Delhi University, Delhi, India
2. JNU, New Delhi, India
3. Ambedkar university, New Delhi, India
4. Berhampur University, Odisha, India
5. Utkal University, Bhubaneswar, India
6. Sambalpur University, Sambalpur, India
7. SNDT University, Mumbai, India
8. Xaviers University, Bhubaneswar, India
9. Mumbai University, Mumbai, India
10. Jammu University, Jammu, India
11. Andhra Unversity, Vizag, India
12. TISS, Mumbai, India

c. Dual – 4

1. Calcutta University, Kolkotta, India
2. Jamia Milia Islamia University, New Delhi, India
3. University of Mysore, Mysore, India
4. University of Pune, Pune, India

B. **Response on Basics about OER**

Questions	**Yes (percentage)**	**No (percentage)**
Are you aware of the concept of OER?	188 (93.1%)	14 (6.9%)
Will you share your courses as OER?	174 (86.1%)	28 (13.9%)
Have you ever used OER?	40 (19.8%)	162 (80.2%)

The three basic questions on OER reveal that 93.1% of respondents are aware of the concept of OER but so far only 19.8% respondents have used OER in any form. Whereas 86.1% are willing to share their courses as OER.

Reliability analysis

The results of the Chrobach's alpha (α) co-efficient for the 19-item instrument were 0.888. The result exceeds the recommend threshold value of 0.70.

Correlation analysis

Table 6 provides a summary of Pearson correlation analysis to test the relationships among the UTAUT constructs and BI to use OER. The convergent validity and discriminate validity are also assessed.

As per social science research guidelines Factor (items) loading results of items higher than 0.50 indicate items are loaded significantly (Hair, Anderson, Tatham & Black, 1998). In the present research model all the items are loaded significantly ($p<.01$) except in the case of the factor SI whose significance is at $p<.05$. Therefore *all the items in this model have adequate reliability and convergent validity*. The model also suggests that there is highly significant (at .01 level) relationship between PE, EE and FC with BI and significant (at.05 level) relationship between SI and BI.

Table 6: Pearson's Correlations among four constructs and BI

		BI	PE	EE	SI	FC
BI	Pearson Correlation	1	.687**	.698**	.157*	.460**
	N	202	202	202	202	202
PE	Pearson Correlation	.687**	1	.844**	.085	.532**
	N	202	202	202	202	202
EE	Pearson Correlation	.698**	.844**	1	.226**	.726**
	N	202	202	202	202	202
SI	Pearson Correlation	.157*	.085	.226**	1	.236**
	N	202	202	202	202	202
FC	Pearson Correlation	.460**	.532**	.726**	.236**	1
	N	202	202	202	202	202

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Regression Analysis

Multivariate linear regression analysis is used to assess the effect of PE, EE, SI and FC on intention (BI) to use OER. Table 7 shows a summary of the research model.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.723[a]	.523	.513	.42721

[a] Predictors: (Constant), FC, SI, PE, EE

To assess the model four constructs i.e., PE, EE, SE and FC were loaded as independent variable and BI as dependent variable and then subjected to linear regression analysis. The model explains 51.3% of the variance (adjusted R square: .513) influence on teachers' intention to use OER. This can be considered as a good model as it is considered higher the adjusted R square value, it is considered as better model (Moksony, 1990).

Confirmation of Hypothesis

Regression analysis was used to determine the standardised and non-standardised coefficients for the constructs entered in the model. Table 8 shows the results of the regression.

Table 8: Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.233	.334		3.698	.000
	PE	.259	.072	.342	3.581	.000
	EE	.427	.116	.434	3.682	.000
	SI	.061	.075	.042	.803	.423
	FC	-.063	.098	-.047	-.643	.521

[a] Dependent Variable: BI

Hypothesis 1. *Performance expectancy has a positive impact on the intentions to use OER.*

The results indicate that that performance expectancy positively impact on intentions to use OER (β = .342, P < .001). Therefore **H1 is supported**. It means, teachers feel that by using OER their course development, teaching and outcome of learners will be better, easier and quicker. It will also help in increasing learners' outcome. At the same time, OER enables to have wider access to latest resources by using OER.

Hypothesis 2. *Effort expectancy has a positive impact on the intention to use OER*.

The results show that effort expectancy has positive effect on intention to use OER (β =.434, P < .001). Hence, **H2 is supported**. It indicates that teachers are of the opinion that OER can be learnt easily and also easy to learn. Interaction with OER is clear and easy for using and integrating in courses.

Hypothesis 3. *Social influence has a positive impact on the intention to use OER*.

The results clearly indicates that social influence has no effect on intention to use (β =.042, P<.423). The results show that the respondents' social circle i.e. peers, friends, staff etc. have no influence on them to use OER. Teachers feel that university may not encourage the use of OER in teaching and learning. Therefore **H3 is not supported.**

Hypothesis 4. *Facilitating conditions have a positive effect on intention to use OER*.

The results show that facilitating conditions do not have positive effect on intention to use OER (β = -.047, p < .521). Hence the **H4 is not supported.** It means teachers do not have resources and supporting conditions to use OER. Respondents feel that they do not have requisite knowledge for using and integrating OER in their courses. They are not confident about if they will get any support from university for using OER or not.

Table 9 shows the confirmation of hypotheses.

Table 9: Confirmation of Hypotheses

Hypothesis	Regression result	Confirmation
H1 : PE	Highly significant (β = .342, P < .001)	Yes
H2 : EE	Highly significant (β = .434, P < .001)	Yes
H3: SI	Not significant (β = .042, p < .423	No
H4: FC	Not significant (β = -.047, p < .521)	No

In Mtebe and Raisamo (2014) study only the H2 (i.e effort expectancy) is supported. However, in this study H1: performance expectancy and H2: effort expectancy are supported.

Opinion about not using OER

The last question of the questionnaire was *'In your opinion why higher education in India do not use OER?'* The following table provides a brief about various reasons or factors for not using OER. The factors are derived from the opinion of the respondents.

The opinion revealed the key factors of not using OER. Although the teachers have fair knowledge about OER, they feel there are many challenges with regard to usage of OER use. quality, accessibility, facilitating conditions, sharing pattern, ownership, authenticity, copyright and plagiarism issues. At the same time the respondents are of the view that OER can be used in Indian higher education subject to proper policy in place and also encouragement to use OER. In table 10 the major factors are presented and the each factor is substantiated with reasons.

Table 10: Not using OER: Key Factors

Factors	Major Reasons as opined by respondents
a. Awareness and training	• There is lack of awareness and also lack of knowledge and skill in how OER can be used- • Lot of respondents is of this view that they are not well trained to use OER. • Awareness is lacking on the learning and teaching side with regard to use of OER • Not techno- savvy, absence of proper guidance. • Perhaps because of problems related to access, attitude, linguistic barriers • Lack of knowledge of availability of such resources. • The faculty is not oriented about how to use OER in teaching. • Due to Non Awareness. The Culture of using need to be developed as it can dis-seminate education and promote collaborative learning • Lack of training to the teacher regarding OER technologies is the biggest hurdle • Ignorance about OER • Lack of awareness on uses rights (licensing) of OER material
b. Infrastructure	• There are many factors like access, speed of Internet, economical conditions of the students, reach in rural area, etc. • Lack of resources / technology to access Internet. • Insufficient access to OER for the students. • Faculty does not have access to OER sites (e g, we do not have access to YouTube and FB from university). This brings in challenges in accessing • Shortage of multimedia based OER in Indian context, • Shortage of OER in vernacular languages of India

Factors	Major Reasons as opined by respondents
c. Policy, attitude and management	• Lack of strong institutional policies • Now a days Internet in flooded with OER, there must be some mechanism to evaluate those OER and a comprehensive list can be prepared subject wise and updated regularly by bodies like UGC, AICTE, MCI, etc. • May be the faculty has doubts in the quality of OER as they are freely available. Also the authenticity of the material is under question. • Absence of proper database by Indian regulatory bodies is also a matter of concern shown by respondents problems related to access, attitude. • Even today, teachers and students do not use OER in regular teaching and learning. It is treated as supplementary resource. Also OER faces the problem of its authenticity. Since syllabus and evaluation pattern differs, OER available can not used as it is. • Cost of Use and technical illiteracy, non-support from the employer, mindset of teachers
d. Plagiarism and copyright	• May be due to plagiarism- Respondents fear about plagiarism issues that may arise due to usage of OER. • Copy right issues • Fear because of no proper copyright guidelines. • Many academicians do not want to share their content or want to keep ownership with them • Apprehensions that the hard work of a person might just get copy pasted without his approval or knowledge.

Conclusion

The present study has tried to bridge the research gap on the usage and acceptance of OER in India. The results of the study indicate that the university teachers are very much aware of the concept of OER. But, they are not yet sure about the usage of OER in teaching and learning. Majority of them have not used OER in teaching but are willing to share their courses as OER. The investigative UTAUT research model supports two construct i.e. performance expectancy and effort expectancy and do not support two constructs i.e. facilitating condition and social influence. The correlation analysis indicate that three variables i.e. performance expectancy, effort expectancy and facilitating conditions are loaded significantly with intention to use OER and social influence is significantly loaded. The adjusted R-square value establishes the model. If we consider each construct independently and see their impact on intention to use OER then the finding are as stated below:

- Teachers feel that by using OER their course development, teaching and outcome of learners will be better, easier and quicker. It will also help in increasing learners' outcome. At the same time, OER enables to have wider access to latest resources by using OER.
- Teachers are of the opinion that OER can be learnt easily and also easy to learn. Interaction with OER is clear and easy for using and integrating in courses.
- Teachers' social circle i.e. peers; friends; staff etc. have no influence on them to use OER. Teachers feel that university may not encourage the use of OER in teaching and learning.
- Teachers do not have resources and supporting conditions to use OER. Respondents feel that they do not have requisite knowledge for using and integrating OER in their courses. They are not confident about if they will get any support from university for using OER or not.

Suggestions for better usage of OER

It can be inferred from the study that teachers are aware of the usage of OER. They intend to use OER because of two reasons i.e., increase in performance and easy to use. The challenges they face are lack of facilitating conditions and positive social influence on the usage of OER. It is also felt that there should be proper policy in place, the policy makers and regulating bodies should provide guidelines. Proper infrastructure and training should be provided for fully utilizing the OER. Also if there will be any encouragement or reward for using OER then teachers will feel motivated to use OER in their teaching and research activities.

Lack of unity on the usage and acceptance of OER can be dealt only if these challenges and concerns are dealt properly. To conclude, in the context of Indian higher education, OER is accepted as an idea but the implementation and usage are still far away.

Acknowledgement

The research model and questionnaire of Mtebe and Rasamo (2014) study is used with their permission.

References

Bansal, T., Chabra, S. Q. & Joshi, D. (2013). Current initiatives and challenges to OERs in Indian higher education. *Asian Journal of Distance Education, 11*(1), 4–18. Retrieved from http://www.asianjde.org/2013v11.1.Bansal.pdf

Das, A. K. (2011). Emergence of Open Educational resources (OER) in India and its impact on lifelong learning. *Library Hi Tech News, 28*(5), 10–15. https://doi.org/10.1108/07419051111163848

Hair, J. F., Anderson, R.E., Tatham, R. L. & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). NJ: Prentice Hall.

Moksony, F. (1990). Small is beautiful. The use and interpretation of R2 in social research. *Szociológiai Szemle, Special issue*, 130–138.

Mtebe, J. S. & Raisamo R. (2014). Challenges and Instructors intention to adopt and use open educational resources in higher education in Tanzania. *The International Review of Research in Open and Distributed Learning, 15*(1). http://dx.doi.org/10.19173/irrodl.v15i1.1687

Sharma, M., Mishra, S. & Thakur, A. (2014). Development and Validation of a scale to measure faculty attitudes towards open education resources. *Proceedings of the 28th AAOU Annual Conference, The Open University of Hong Kong, 28–31 October* (pp. 618–624).

Sharma, R. C. (2013). Open Educational Resources: Strategies to enhance networking and collaborative opportunities. Keynote delivered on 21st February 2013, at *India-Canada International Conference on Open and Flexible Distance Learning*, SNDT Women's University, Mumbai.

Tan, P.J.B. (2013). Applying the UTAUT to understand factors affecting the use of English e-learning websites in Taiwan. *Sage Open, 3*(4). https://doi.org/10.1177/2158244013503837

Venkaiah, V. (Undated). *Open educational resources in India – A Study of attitudes and perceptions of distance teachers*. Retrieved from https://wikieducator.org/images/d/d7/PID_386.pdf

Venkatesh, V., Morris, M., Davis, G. & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478. https://doi.org/10.2307/30036540